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utlook Cloudy -p. 119
c Steel Output -p. 121

Illinois U Library

The
IRON AGE

APRIL 22, 1948

Bearing failures ended

when Farval was installed

on forging presses

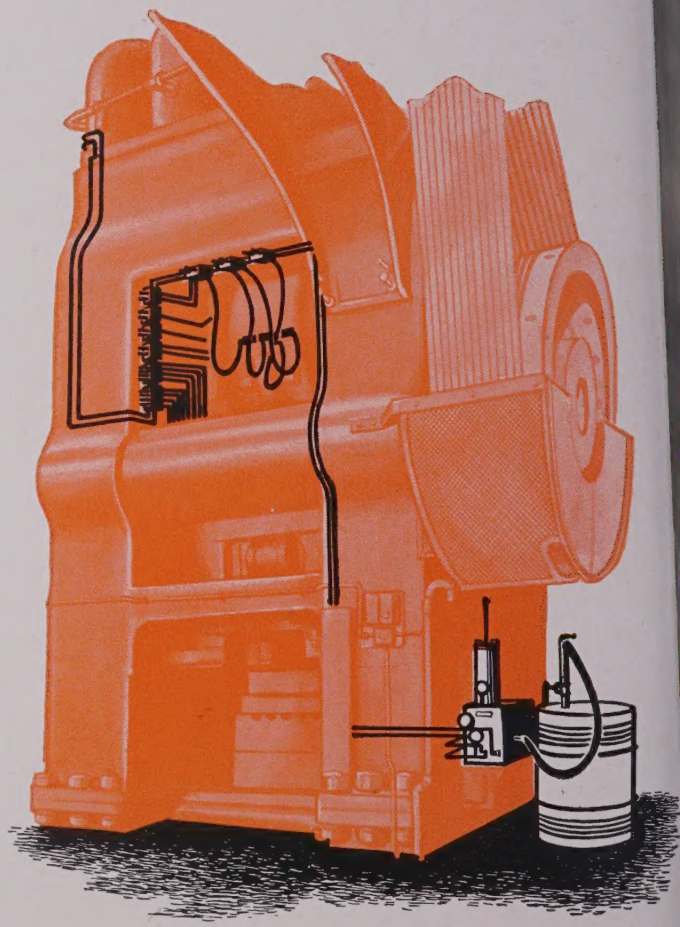
IN a metal working plant, upsetters and forging presses were always in trouble due to improper lubrication. Failures occurred unexpectedly, because of irregular and inadequate delivery of oil to Pitman and other important bearings. Valuable production time had to be sacrificed in making frequent repairs. The cost of each overhaul ran $3,500 to $5,000 in labor and parts alone.

Finally, Farval Systems of Centralized Lubrication were installed. Since then there has not been a single bearing failure. Not one overhaul has been necessary. Upsetters and forging presses work smoothly and continuously, doing their jobs efficiently and exactly as they were designed by their builders to do.

Farval delivers oil or grease under pressure to a group of bearings from one central station, in exact quantities, as often as desired. It can do its work while a machine is in operation. Farval is the Dualine System with the Positive Piston Displacement Valve. This valve has but two moving parts and is fully adjustable, with a Tell-tale indicator at each bearing to show the job is done.

For a full description of Farval, write for Bulletin 25. The Farval Corporation, 3252 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.



FARVAL—*Studies in Centralized Lubrication* No. 101

FARVAL

CENTRALIZED SYSTEMS OF LUBRICATION

THE IRON AGE, published every Thursday by the CHILTON CO. (INC), Chestnut and 56th Sts., Philadelphia 39, Pa
Entered as second class matter Nov. 8, 1932, at the Post Office at Philadelphia under act of March 3, 1879.
yearly in United States, its territories and Canada; other Western Hemisphere Countries $15; other Forei
Countries $20 per year. Single Copies 35¢. Annual Review Number $2.00 Vol. 161 No. 17

They all listen in on our Party Line

and we like it!

Although the Barium Steel Corporation plants are spread across seven states, their executives and technicians live in a closely knit corporate neighborhood. They have a common interest in steel and share their specialized skills with one another to produce the finest steel products that can be made.

We encourage this spirit of neighborliness because our customers like it. The cumulative knowledge of these men is used to make satisfied customers. We invite you to get acquainted with the Barium Subsidiaries that make the products you need.

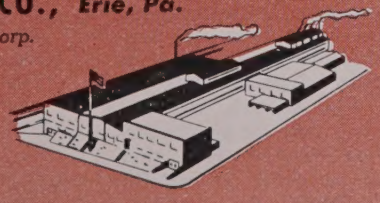
WE MELT, CAST, FORGE, STAMP, MACHINE AND FABRICATE STEEL

ONE OF THE 16 BARIUM GOOD NEIGHBORS

ERIE BOLT & NUT CO., *Erie, Pa.*

Subsidiary of Barium Steel Corp.

A leading manufacturer of special alloy bolts, nut studs and related products used by builders of equipment for industry, transport, farm and home.



Barium STEEL CORPORATION

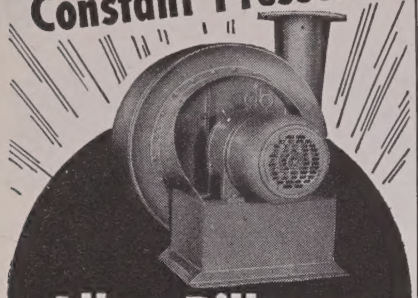
STEELWRIGHT TO THE NATION

BARIUM STEEL CORPORATION

EXECUTIVE OFFICES
25 BROAD ST., NEW YORK, N. Y.

AMERICAN STEEL TRACTOR CORP., *Canton, Ohio* • CLYDE IRON WORKS, INC., *Duluth, Minn.* • CENTRAL IRON AND STEEL COMPANY., *Harrisburg, Pa.* BARIUM STEEL & FORGE, INC., *Canton, Ohio* • BARIUM EQUIPMENT CORP., BARIUM STEEL EXPORT, INC. • BAYONNE BOLT CORP., *Bayonne, N. J.* THE CUYAHOGA SPRING COMPANY, *Cleveland, Ohio* • THE GEOMETRIC STAMPING COMPANY, *Cleveland, Ohio* • PERMA-JACK CORP., *Cleveland, Ohio* PORCELAIN STEELS CORP., *Cleveland, Ohio* • THE DETROIT STEEL CASTING COMPANY, *Detroit, Mich.* • SHEFFIELD IRON & STEEL CO., *Sheffield, Ala.* KERMATH MANUFACTURING COMPANY, *Detroit, Mich.* • KERMATH (CANADA) LTD., *Toronto, Ontario, Canada* • REPUBLIC INDUSTRIES, INC., *N. Y.* GLOBE FORGE, INC., *Syracuse, N.Y.* • ERIE BOLT & NUT COMPANY, *Erie, Pa.* • WILEY MANUFACTURING COMPANY, *Mountville, Pa., and Port Deposit, Md.*

For AIR or GAS at Constant Pressure!



Allen-Billmyre
CENTRIFUGAL TYPE
Blowers and Exhausters

- Inherently Self-Governing
- Quiet and Vibrationless
- Only One Moving Part . . .

Power consumption varies with the load and a constant pressure is maintained through the entire capacity range.

Only two bearings—located well outside of the housing—require lubrication.

External bearings assure clean dry air at all times.

Ample clearances permit normal quantities of dust to pass through the machine without harmful effect.

The impeller assembly—the only moving part—is accurately balanced.

Allen-Billmyre Blowers and Exhausters are highly efficient for Agitation and Aeration . . . Manufacture of Gases, Acids . . . Combustion Processes . . . Conveying . . . Cooling and Ventilation . . . and all low Pressure and Vacuum Requirements

Made in wide range of sizes for ½ to 200 HP

FREE!

Send for Bulletin B-5. Describes Blowers and Exhausters . . . their application and specifications.

ALLEN-BILLMYRE DIVISION
LAMSON CORPORATION
485 Lamson St. Syracuse, N.Y.

Fatigue Cracks

BY C. T. POST

The Red Flag

• • Henry Wallace should have had better sense than to pick northern Westchester County for a suburban home while he carried on his campaign in New York City. Wallace's fellow commuters on the New York Central's Harlem Division are about 95 pct Republican and poor candidates for conversion to the Wallace doctrines.

The other morning, coming in on the train, Wallace was buried in his newspaper, ignoring the other passengers and apparently ignored by them. But one wag decided that the presence of a presidential candidate could not be overlooked. He quietly walked to the end of the train, snitched the brakeman's red flag. Back to the Wallace car, he raised the flag on high, marched up and down the aisle, shouting "Vote for Wallace!". Wallace studiously ignored the newfound support, raised the newspaper higher. His face assumed the color of the flag. Next morning, he apparently rode a different train.

Amateur Farmer

• • Not since the days when "Alfalfa Bill" Murray, as governor of Oklahoma, planted the state capital lawn to crops, have we seen anything quite resembling another recent Wallace nip-nup. The New York newspapers report that Henry has sown some hybrid corn in a small patch of earth alongside his headquarters on swanky Park Ave. We don't quite get the idea of this stunt unless it is to show he is a farm boy at heart. If that's the theory, we're afraid it isn't going to work out very well. According to the garden guides for this section of the country, planting season for corn still is some weeks away.

Data

• • Little has been heard from our Greenwich Village correspondent lately, and we'd assumed that life down there had quieted down since assorted financiers, statesmen and Eleanor Roosevelt took up residence. Looking aimlessly through the Manhattan telephone directory the other day, though, we ran across a listing that set us wondering. Someday when we have time we're going to check up on the University Pants & Novelties Corp., 88 University Place, GRamercy 3-2768.

"A" Is for "And"

• • Of all the alphabetical entities to come out of Washington, ERP, known as the Marshall Plan in polite society, has been the most suggestive of governmental indigestion. Undoubtedly, one reason Congress expanded the European Recovery Program to one of global aid was to eradicate any possible suggestion that Uncle Sam had been lunching on beer and cucumbers. We note with relief that the broadened program will be administered by ECA, the Economic Cooperation Administration. Make something of that, if you can.

Running down a rumor, we checked up the other day on JANMAT, that alphabetical demon that plays tag with machine tools, apparently wielding an unholy influence on the life of everyone in the tool business. Someone whispered to us the letters JANMAT really didn't stand for anything, that JANMAT was nothing but the cable code for the agency that was causing all the stir. We telephoned the information desk of WAA and confronted the girl with this accusation. She tried to wriggle out of it, asserting that JANMAT's real name is the Joint Army Navy Machine and Tool Program. Following any sort of a code of alphabetical agency ethics, that would be JANMTP. The "and" clearly was stuck in for no good reason; moreover, "and" always should be ignored in coining an alphabetism. There is no good reason for dropping the "P". For our money, JANMAT stands revealed as an imposter.

Puzzle

• • We'd like to be able to report that the following came from our 8 yr old daughter, but unfortunately we found it in the *Jaqua Way*, that beautifully edited customer magazine of The Jaqua Co., Grand Rapids advertising agency:

> *"This is a puzzle to end all such puzzles: Two fast trains are approaching each other on a single track. Each train is going 74 mph. The engineer of one is a Norwegian while the engineer of the other is drunk. The trains are 326½ yds apart. Will there be a crash?"*

The answer given is: "Norse is Norse and Souse is Souse and never the twain shall meet."

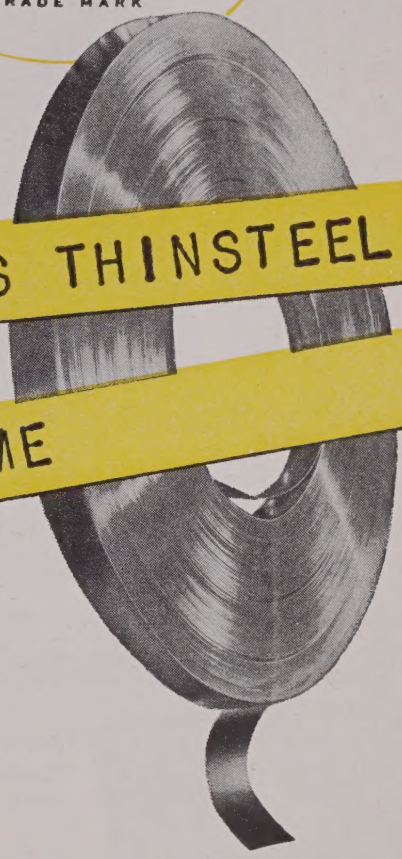
Jaqua's editor Bill Peterson deserves the highest medal the highest medal the American Association of Railroads can bestow. That certainly *should* end all such puzzles!

CMP stainless

THINSTEEL

TRADE MARK

This important message means improved or new stainless products at lower fabricating costs.



CHROME-NICKEL STAINLESS THINSTEEL AVAILABLE FOR FIRST TIME

It's another FIRST for CMP — light gauge 18-8 and other chrome-nickel grades of stainless strip steel with a bright rolled mirror-like finish even in dead soft annealed temper. Stainless fabricators familiar with the lustrous rolled finish generally identified in annealed stainless only with chromium grades such as Type 430 will immediately recognize the possibilities of new applications, increased utility and beauty, together with lowered finishing costs which this interesting development in chrome-nickel stainless now suggests. We will be glad to send you a sample of this new product and will welcome the opportunity to explore any application where a combination of corrosion resistance and beauty of appearance in light gauge metal strip is desirable.

COLD FACTS ON

THINSTEEL

- **EXTRA LONG COILS**
  ... less downtime
- **EXTREMELY CLOSE TOLERANCES**
  ... more parts per ton
- **WIDE RANGE OF PHYSICALS AND ANALYSES**
  ... tailored for your products
- **GAUGES THIN AS .001"**
  ... strength with lightness

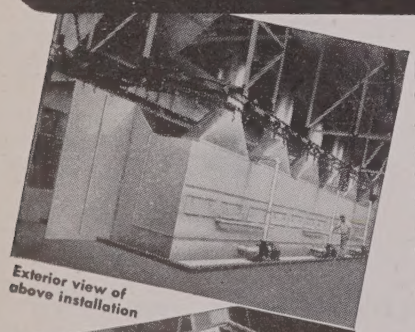
C M P STRIP STEEL — PRECISION COLD ROLLED

the Cold Metal Products co.

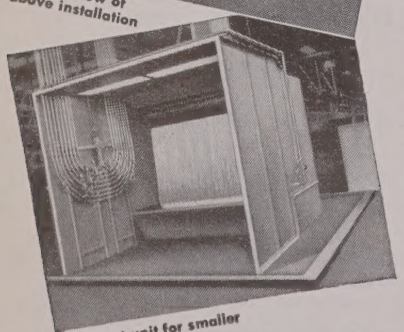
YOUNGSTOWN 1, OHIO

NEW YORK • CHICAGO • DETROIT • ST. LOUIS • BUFFALO • INDIANAPOLIS • LOS ANGELES • SAN FRANCISCO

Carries Away Overspray . . .
IN A WHIRLING TORNADO OF WATER



Exterior view of above installation



Compact unit for smaller spraying jobs

PAINT-LADEN AIR IS "TORNADO" CLEANED. Operators, working in a Schmieg Centri-Merge Spray Booth, are adequately protected from fire and fumes. Overspray is carried on an air stream *horizontally* away from work into a curtain of water, pressure-fed through slots extending continuously full width of booth, that descends down the flood sheet. The mixture of fume and paint-laden air and water is then whirled under the flood sheet and hurled with tremendous impact against the impingement wall at back of booth. Down this impingement wall flows an additional sheet of water that floods the foreign matter, pounded out in the process, into the sludge tank below. Only CLEAN AIR passes through exhaust fan. Thus the danger of fire is suppressed both in front and behind the flood sheet. Because the ratio of water and air is far greater in Centri-Merge, paint and other gummy substances do not pile up on the hard-to-get-at walls of the chamber behind the flood sheet; therefore, cost of repeated cleanings is eliminated.

Consult Schmieg engineers regarding your problems of dust and fume control.

THE *best* AIR PURGE *is* CENTRI-MERGE

Schmieg INDUSTRIES INC.
Engineers & Manufacturers
296 PIQUETTE AVENUE • DETROIT 2, MICHIGAN

Dear Editor:

CORRECT ADDRESS

Sir:

Can you furnish me with the correct mail address of a factory named Wysong & Miles, who make a line of power squaring shears.

L. B. ADAMS

L. B. Adams & Co.
Baton Rouge, La.

• **The address we have is 623 Fulton St., Greensboro, N. C.—Ed.**

MATERIALS FROM JAPAN

Sir:

Would you please advise me the address of the Yaras Co., referred to in one of the recent West Coast columns (Jan. 22, p. 88) who I understand are importing scrap iron from Japan to the U.S., and also the address of Hubert D. Long who is also an importer of materials from Japan, which was written up in the West Coast of Dec. 11, 1947.

JOHN W. MOORE

John Moore Specialty Co.
Chicago

• **Yaras & Co. has its headquarters at 724 South Spring St., Los Angeles, and Hubert D. Long may be reached at 6526 Sunset Blvd., Los Angeles 28. Both these companies are interested in importing materials such as iron and steel from Japan although to our knowledge Yaras & Co. at present has no plans for importing scrap iron and steel. Mr. Gordon Behr, affiliated with this company has recently returned from Japan and is scheduled to go back there very soon. Perhaps a letter addressed to him would develop detailed information.—Ed.**

TUBE PRODUCTION

Sir:

Will you please send me copies of the articles, "Gas Heating Speeds Seamless Tube Production" published in the June 5, 1947 issue, and "Tubes and Tube Making—Development of an Industry," in the Dec. 16, 23, and 30, 1943 issues.

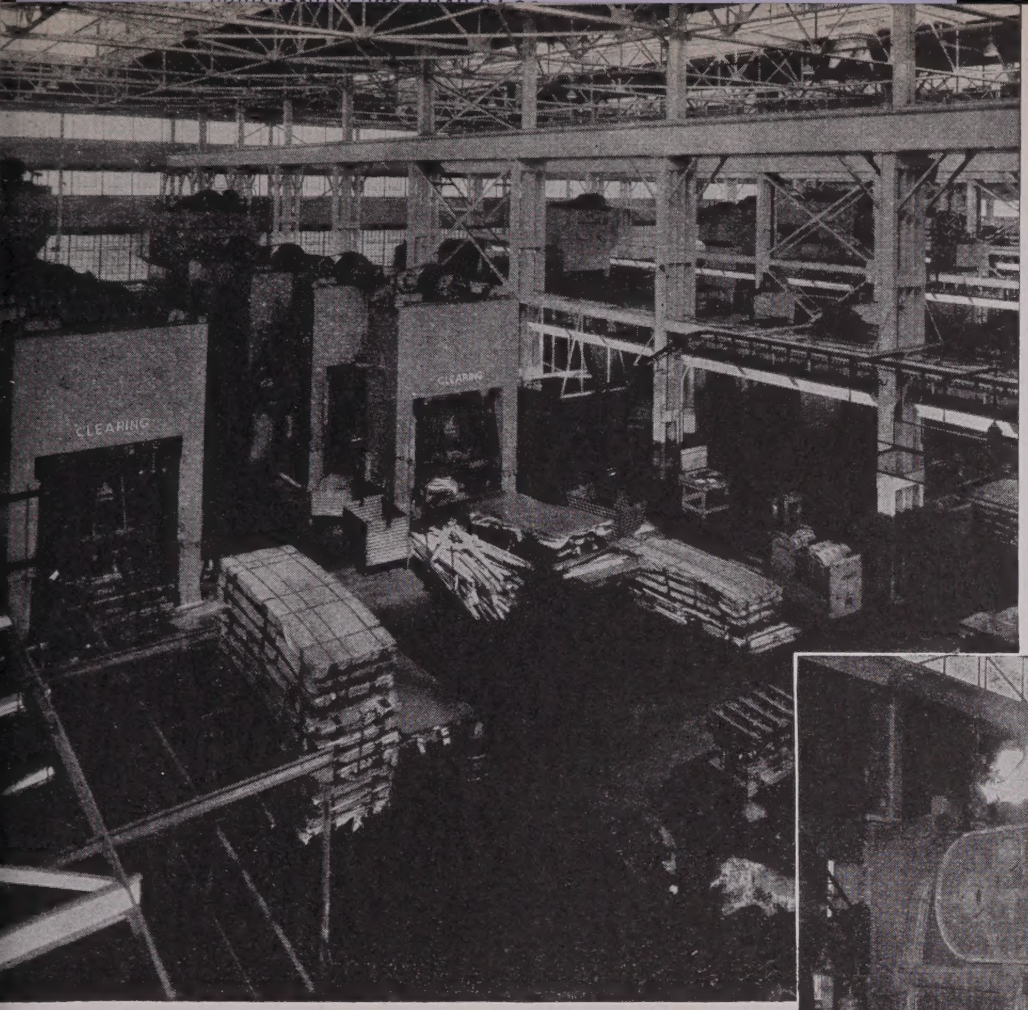
E. L. ZAPP
Chief Metallurgist

Tube Reducing Corp.
Wallington, N. J.

MACHINE TOOL LIFE

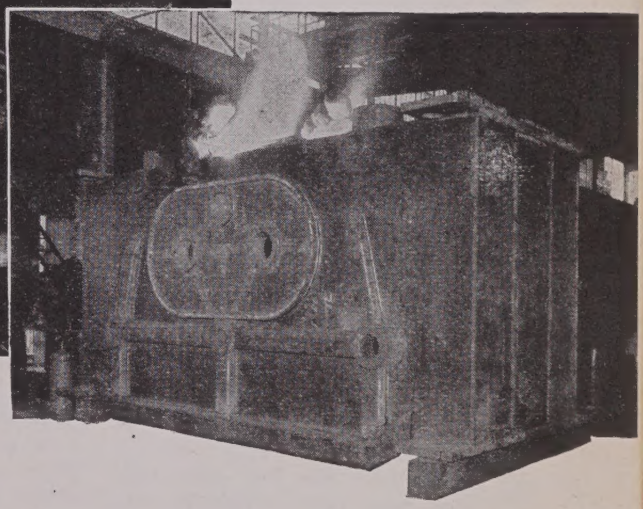
Sir:

We are interested in obtaining information regarding the expected life of our machine tools in order to forecast our approximate replacement dates. We realize that there are many factors that influence this problem, but we thought you would be able to supply



CMC
CLEARING
MECHANICAL & HYDRAULIC

INSET: Clearing presses are built of rolled steel plate welded into one unit insuring minimum deflection at maximum rigidity. This type of construction permits the flexibility of design for which Clearing is well known.



WHY STOP SHORT OF MAXIMUM ECONOMY?

Production men agree that press methods are faster and far less costly than other means of giving shape to metal—but why stop there? Careful choice and application of the press itself can usually produce still further cost reductions.

A most important factor in press operation costs is the life of the dies. Frame rigidity and proper guiding of the slide make dies last longer and require fewer regrinds. That's why Clearing has always emphasized these features in its design. Clearing *pioneered* the welded, all-steel frame because such frames are inherently more rigid.

Save money by pressing rather than casting—yes. But secure *maximum* saving by doing the press job on a Clearing. Ask us to show you how and why. It costs you nothing to ask for facts.

CLEARING MACHINE CORPORATION • 6499 W. 65th St., Chicago 38, Ill.

CLEARING THE WAY TO EFFICIENT MASS PRODUCTION

CMC CLEARING

Ohio Electric announces a welded lifting magnet with *PROTECTO-WELD* design

The easiest way to protect the weld on a welded lifting magnet is obvious: PUT IT ON TOP.

That's the big advantage of new Ohio PROTECTO-WELD magnets. Outer ring and top plate are welded together *on top of the magnet.* Frequent blows against the outer ring *cannot crack or damage the weld.* Ohio PROTECTO-WELD magnets remain hermetically sealed against moisture indefinitely!

Three sizes of this new magnet are now in production. They measure 39, 55 and 65 inches in diameter. Name the lifting job—we can give you all the strength you need. Besides the 4-coil construction, there are also 6 or 8-coil magnets for that *extra Ohio lifting strength.*

These PROTECTO-WELD magnets have the well known Ohio chain pins that fit into square-holed ears—to eliminate friction and prolong life. Ohio Armored Weatherproof cable connectors withstand severe abuse. Bayonet joints for hand operation save time in making and breaking connections. Shielded contacts provide safety from arcs.

This new Ohio PROTECTO-WELD magnet is a rugged tool for your roughest jobs. *Details?* Write today to Ohio: *leader in magnetic materials handling.*

Ohio MAGNETS

also a leading name in the small motor field

THE OHIO ELECTRIC MFG. CO.

5908 MAURICE AVE. • CLEVELAND 4, OHIO

us with information. Any articles or other data which you might know about regarding machine tool life would be appreciated. We are equipped with turret and engine lathes, gear hobbers, drill presses, automatic and hand screw machines, grinders, and other miscellaneous equipment.

T. A. PAXTON
Executive Vice President
Southern Textile Machinery Co.
Paducah, Ky.

• **Your inquiry on expected life of machine tools is a problem that has caused considerable discussion over the years and very few accurate conclusions. However, we are forwarding an article, "Liberalized Depreciation" which appeared in the Jan. 1 issue and which outlines some of the factors that must be considered in determining tool life. Bulletin F published by the U.S. Treasury Dept. takes the view that life of machine tools is that period during which they can be used for their original intended purpose. However, the factors of obsolescence, new product design, loss of accuracy, multiple shift operation, the need for stimulation of management to maintain modern shops, and the desirability of stimulating new venture investment all have an effect on the depreciation problem, aid, consequently, the effective machine tool life.—Ed.**

EXTRUSION MOLDING

Sir:

Please send me a copy of "The Extrusion Molding Process" by H. B. Cook as it appeared in the Jan. 29 and Feb. 5 issues. . . .

T. A. SCHNEIDER
Instructor, Mechanical Engineering Dept.
Newark College of Engineering
Newark, N. J.

THREAD ROLLING

Sir:

Enclosed herewith please find $2.00 for which I would like to have two sets of three articles each covering "Thread Rolling Theory and Practice" by J. W. Batchelder. As I recall it, these articles started to run in 1946 and continued through the early part of 1947.

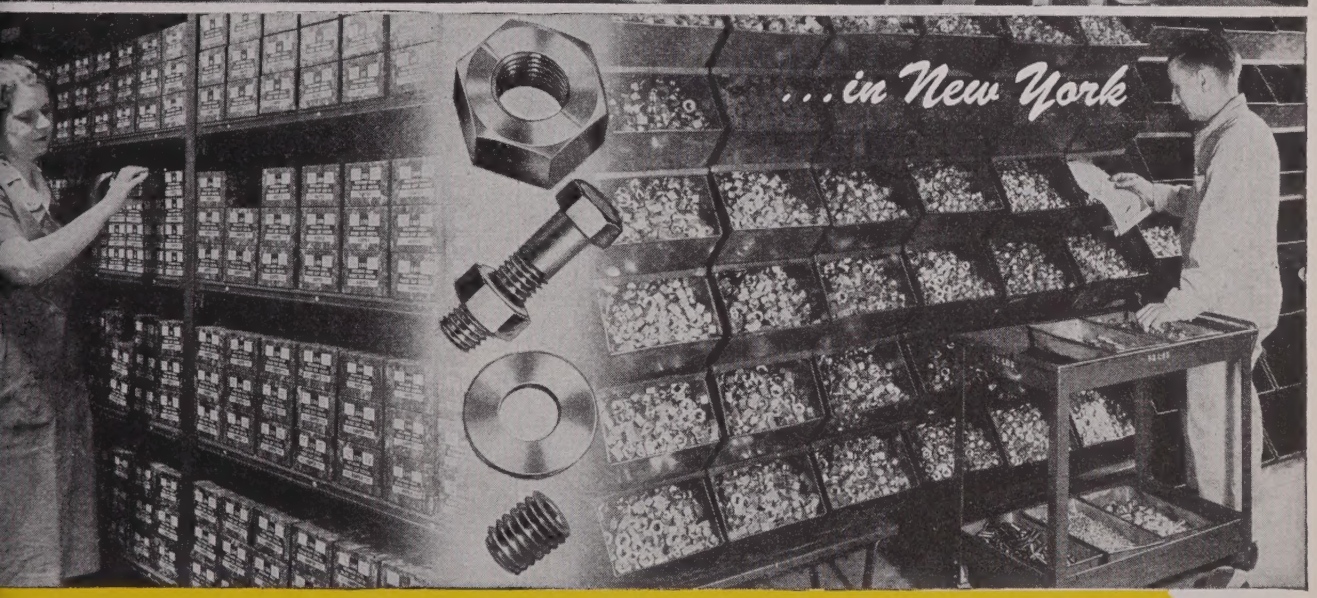
E. G. WERTHEIMER
Chief Engineer
Sterling Bolt Co.
Chicago

PRODUCTION PLANNING

Sir:

We note with interest the article appearing in the Jan. 29 issue entitled "Production Control" by Donald Peddie, also the article entitled "Crucible Modernizes Wire Mill." We found both of these articles very interesting and pertinent to our line of business. Would you

For "Special" *and* "Hard-to-get" Fastenings
Come to HARPER STOCKS



Resistant to Rust and Corrosion

Bolts
Nuts
Screws
Washers
Rivets
Nails
in
Brass
Bronzes
Monel Metal
Stainless Steels

HARPER'S 25th Anniversary

Over **5000** different types and sizes of non-ferrous and stainless steel fastenings are carried in Harper stocks at New York and Chicago **for immediate shipment.** Many are often considered "special" or "hard-to-get"—but Harper has them; and they are in stock for you because of a conistent, 25-year policy of constantly adding odd and unusual items to stock.

All Harper fastenings are corrosion resistant; many are non-magnetic, non-sparking; can be used again and again, give longer service, speed dis-assembly, stand up under adverse conditions where other fastenings "freeze" or fail.

Phone or Wire for "special" or "hard-to-get" fastenings for immediate shipment from stock—and write for the Harper catalog. It gives complete specifications and prices on the widest assortment of non-ferrous and stainless steel fastenings available.

THE H. M. HARPER COMPANY
2607 FLETCHER STREET, CHICAGO 18—Phone: Independence 4100
585 WASHINGTON STREET, NEW YORK 11—Phone: Watkins 4-4610
Atlanta, Cambridge, Cincinnati, Cleveland, Dallas, Denver, Detroit, Grand Rapids, Los Angeles, Miami, Milwaukee, Philadelphia, St. Louis, San Francisco, Seattle.

HARPER
Chicago • New York

HARPER SPECIALIZES IN EVERLASTING FASTENINGS*
Reg. U. S. Patent Office

Magnified view of IngAclad Sheet to show proportion of stainless to mild steel.

INGACLAD, the Stainless-Clad Steel that provides 100% stainless protection on the contact or exposed side—at much lower cost than for solid stainless. By using IngAclad you are able to incorporate the advantages of stainless steel in products or applications where otherwise its cost might be prohibitive.

ENGINEERING B-W PRODUCTION

Right now when it is essential to lower costs of products and to save on plant equipment, it will pay you to investigate IngAclad Stainless-Clad Steel. Available in Sheets 18 to 8 gauge and in Plates, 3/16" to 1/4" inclusive.

INGERSOLL *Steel Division*

Borg-Warner Corporation

310 South Michigan Avenue Chicago 4, Illinois

Plants: Chicago, Illinois; New Castle, Indiana; Kalamazoo, Michigan

INGACLAD

STAINLESS-CLAD STEEL

kindly forward a copy of eac of these articles which will becom a valuable part of our informatio files. On p. 58 in the first articl mentioned above there appears a insert listing four articles pertain ing to other types of productio control. We are wondering if i would be possible for you to includ one copy of each of these article when forwarding the other two.

W. L. GRAHAM
General Supervisor, Production Plannin
American Steel & Wire Co.
New Haven, Conn.

• **Tear sheets of the articles are being maile —Ed.**

SILVER ALLOY BRAZING

Sir:

I would like to receive tear sheet of "The ABC's of Silver Allo Brazing" by W. J. Van Natten i the Jan. 8 issue.

ROBERT E. GOULD
Metallurgical Laborator
Raytheon Mfg. Co.
Waltham, Mass.

UNDERSTANDING READER

Sir:

The vigorous manner in whic THE IRON AGE has been combat ting production difficulties has cer tainly not been lost upon us in AF who receive your good publicatio regularly. It was of course some what of a shock to see one of you issues come out as an eight-pag number, but the fact that you got i out at all is certainly a credit t your entire organization. We wer mighty pleased to see that th issues since the first and onl abbreviated one are up to standar even though we again recognize that a superhuman job is being done in getting it out in the presen form. Congratulations to you an to your entire editorial staff for a job well done.

W. W. MALONEY
Secretary-Treasure
American Foundrymen's Assn.
Chicago

• **It is gratifying to have our readers expres their understanding of the production difficul ties in which we are involved due to th printers strike.—Ed.**

SUGGESTION

Sir:

We are in receipt of the Mar. 4 1948 issue. While we regret the circumstances that prompted the necessity of mailing this issue i the volume presented, it has de cided us to offer a suggestion namely: Would it be possible and practical to include the price sectio as a supplement to THE IRON AG

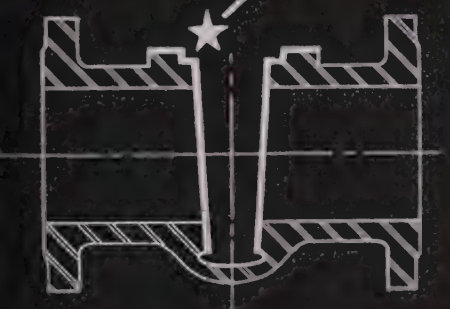
This BULLARD 36" Cut Master is "really paying off" at Newport News Shipbuilding & Drydock Company. Here you see it taper boring a large valve. On this job, it also faces the flange and counter bores, as shown on the cross-sectional drawing. The Cut Master not only saved 33⅓% on these three operations but also provided such a smooth finish that a grinding operation was eliminated.

PERFORMANCE REPORT FROM NEWPORT NEWS SHIPBUILDING & DRYDOCK COMPANY

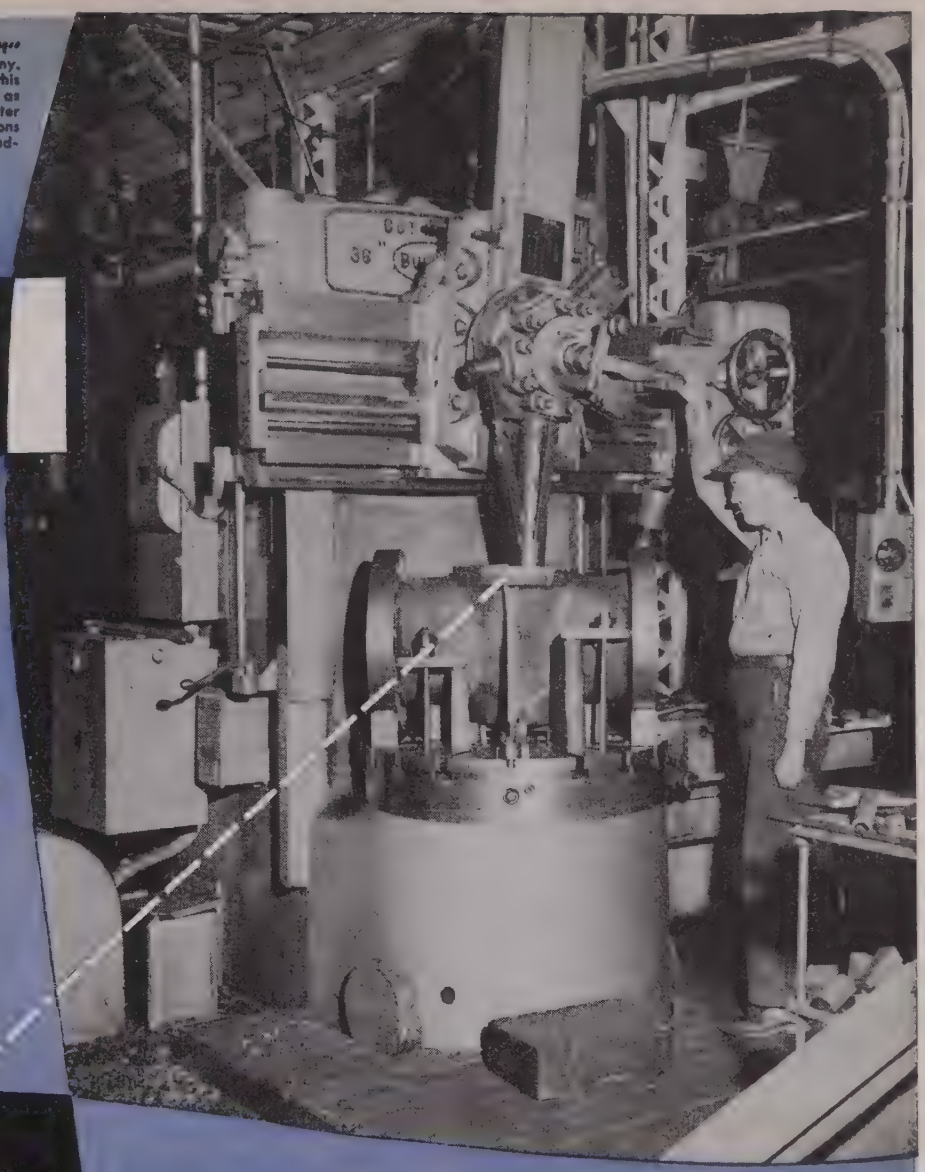
CUTS COSTS 2 WAYS ON CAST STEEL VALVES with a 36" BULLARD Cut Master

1. SAVED 33⅓% ON 3 OPERATIONS

2. ELIMINATED A GRINDING OPERATION



Cross sectional drawing of valve with heavy lines indicating machined surfaces.



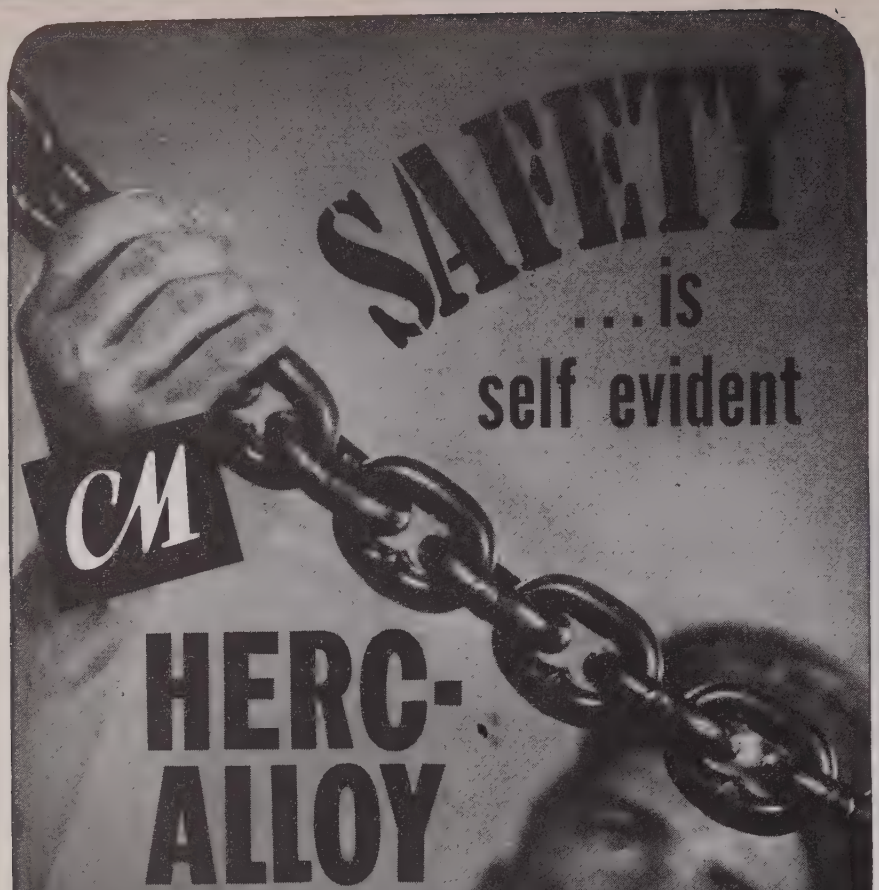
You, too, can expect savings on most of your jobs. It's easy to see why: The bed is cast in one heavy, rigid piece. Spindle is firmly supported top and bottom by large Timken roller bearings. Screw feeds provide and maintain a high degree of machining accuracy.

OTHER COST-CUTTING ADVANTAGES

Because the BULLARD Cut Master was designed specifically to save time on and between cuts, you find other unique features. The rapid and positive speed selection with the BULLARD pendant type control, limit-stops for simplified dimensional duplication, and centralized operating controls speed up operations and conserve costs. For complete description of these and other distinctive features, as well as data on feeds, speeds and sizes, write for Bulletin CVTL-4-1 today. THE BULLARD COMPANY, Bridgeport 2, Connecticut.

BULLARD

BULLARD CREATES *NEW METHODS* TO MAKE MACHINES DO MORE



HERC-ALLOY FEATURES

- America's *first* alloy steel sling chain... first to bear a serial number.
- Every CM HERC-ALLOY Sling Chain is alloy steel throughout... links, rings, hooks. There is only one grade... *the best.*
- Every chain is individually tested and accompanied by a certificate of registration.
- Links are side welded for maximum strength by patented INSWELL electric method.
- HERC-ALLOY Chains should *never* be annealed.
- HERC-ALLOY Chains are lighter... stronger... easier to handle... outlast ordinary chains 4 to 5 times... cost less on the job.

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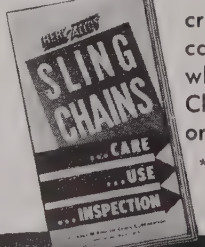
- A simple visual inspection* is all that is needed to determine the continued serviceability of a HERC-ALLOY Chain. That's why more and more of the important companies are standardizing on HERC-ALLOY... because HERC-ALLOY Chains are immune to unseen dangerous crystallization... because you can see when a HERC-ALLOY Chain needs repairs or replacing.



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when again issued in the standa form? Or would it be possible perforate all of the sheets in t price section? The writer has pre ently found it desirable and a vantageous to remove the shee with the price information fro the issues. Others, to whom have spoken, welcome the pri information sheets in one form another separated from, but e closed with THE IRON AGE. Thanki you in advance for any consider tion granted. . . .

JOSEPH G. GAN Purchasing Ag

Fletcher Works
Philadelphia

• We do appreciate your thoughtfulness making this suggestion. It would not very practical, or possible, to have the p section issued as a supplement. For thing, THE IRON AGE is a permanent rec of prices and therefore the price section to be bound in. Secondly, from a product standpoint it would slow up the printing mailing which is on an extremely fast sch ule. The price section is locked up on Tues night and the reader gets the magaz Thursday morning.—Ed.

"VIDA" or "VEDA"

Sir:

I wonder if you could give me t name and address of a seamle tube mill somewhere in New Jers I believe the name is "Vid "Veda," or something similar that. This is all the informati that I have and would apprecia it if you could help me out in t instance.

JOHN W. MOOR

John Moore Specialty Co.
Chicago

• We have checked the seamless tube dustry in the east and are unable to f a mill of any name approaching those suggest. Can some reader help?—Ed.

MOLETTE STEEL

Sir:

Can you advise us what man facturers of steel in the U.S. fab cate Molette steel for the textile i dustry. A list of such manufa turers would be greatly appreciat

ARTHUR SCHUBAC Purchasing Ag

Leon Weill, S. A.
Mexico

• We are not familiar with the term "Mol Steel." There is a Molex steel used for sh blades and dies, marketed by Associa Steel Co., 4545 Houghton Ave., Clevelan Molite high-speed steel used for cutting t is produced by Columbia Tool Steel Co., cago Heights, Ill. If you can give us m information on the type, composition and of Molette steel we shall be happy to s the producer.—Ed.

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The IRON AGE

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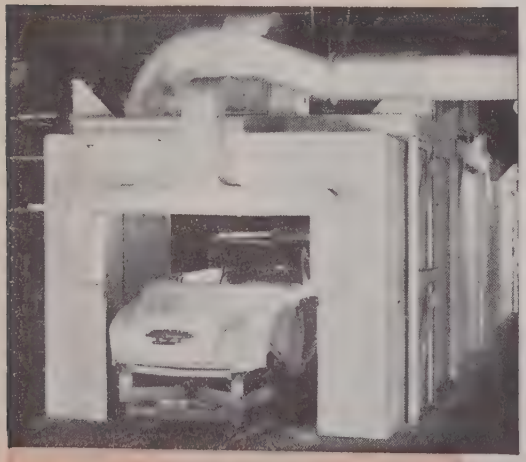
COMPLETE *Finishing* SYSTEMS

for ENAMEL • LACQUER • PAINT

Above: Typical Mahon Filtered Supply Unit which Supplies Clean, Tempered Air to Spray Rooms of Mahon Finishing Systems at Studebaker. At Right: Mahon Hydro-Filter Spray Booths Installed in Production Line for Applying the Fine Finish to Studebaker Convertible Bodies.

Mahon Hydro-Filter Spray Booth for Painting the Underside of Studebaker Convertible Bodies.



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"To His Finger Tips"

Dear Son,

"My, he is a capitalist to his finger tips." This is the sentence that stood out in your letter to me. I can understand how Martin, a Norwegian, raised in a country that borders the Paradise of the Communist, influenced possibly by the socialism which has such vogue in Europe today, might regard my editorial, "Let's Nationalize," as a somewhat unregenerate apostrophe to capitalism.

In all parts of the world today there are millions of young men and women who would give their eye-teeth to come to this country. A recent survey in England showed that 40% of the young men between the ages of 21 and 30 would emigrate if they could, and many of these would like to come to the United States.

During the past two years I have met a number of young Frenchmen of fine families over on temporary visas who have sought to remain here. At a single American Consulate in Rotterdam the number of visa applicants would exhaust the total quota for the next five years. By contrast, we find no long lines in this country waiting for passage to the socialist states of Europe or to those perfect societies behind the iron curtain.

Yet it is in precisely these areas where exploitation for private profit is no longer possible that it is necessary to ring the country with police guards to prevent the escape of its citizens. If you were a student in one of the technical schools in Moscow instead of at M.I.T., you would not have to worry about a job after graduation. A commissar would tell you where to go.

On the other hand, when you have finished at Cambridge, you will be free to go where you wish and offer your services to any employer interested in your talents. It is possible that you may not agree with him on your proper compensation. You are at liberty in this country to question his judgment, to discuss the matter candidly with him without fear of a midnight visit from the secret police. In fact, if you disagree with him you can always take your hat and explore another market.

Consider the meaning of this. It means that you can offer your services in a free, open market to the highest bidder. Both of you are free agents and exercise a free choice. To a youngster with ambition who wants to get ahead, the only limit to his progress is the limit imposed by his own ability, courage and perseverance. By contrast with the stifling limitations of a rigidly controlled society, this country offers the exhilarating atmosphere of freedom and unlimited hope. Is there any wonder that millions of youngsters are eager to leave the carefully regulated stockades of socialist and communist Europe in favor of America's freer pastures?

This is one of the reasons why I am "a capitalist to my finger tips." It is hard to see how any energetic, ambitious, intelligent youngster can be anything else.

Dad

Joseph Stagg Lawrence

Press operators know, if they are to prevent scoring and breakage when drawing steel, they must have sheets of *uniformly* high quality from shipment to shipment . . . sheets with uniform chemical composition, mechanical and surface characteristics . . . sheets uniformly free from laminations and surface defects. That's why they like steel stamped *Inland.* It's uniform and so is its performance! Special care is taken in every stage of production to make sure that the Inland steel shipped to them today is identical, in every respect, to the steel they received last week . . . and last year.

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NEWSFRONT

► The steel gray market is on the upsurge again. During the past 10 days the tempo of activity by brokers searching for high priced steel has increased rapidly. The reason is that brokers now have plenty of gray market orders but are unable to supply the steel--even at gray market prices.

► A boon to British export hopes is an order for 45,000 Ferguson tractors valued at about $50 million to be delivered to the United States during 1949. Ferguson tractors are now coming off the assembly line at such a rate that it is possible for a farmer to get delivery within a week of ordering.

► Prices of the 1949 cars to be introduced by the big three are going to be up to 10 pct higher. The price boost on the new Lincoln and Mercury models is expected to be followed when new models are introduced by the competition.

► The chief reason for the large increase of nickel alloy tubing now on order, is that a 90-day condensate well corrosion test survey showed 9 pct nickel as the most economical choice for this type of corrosion. Estimates of steel on order are given at 3000 net tons, or about 500,000 ft, which includes both 5 pct and 9 pct nickel types. So far only one concern has actually made installations using the nickel grade.

► An interesting aim of the new Polish-Czech alliance is to minimize the effects of ERP on Eastern Europe. The economic alliance is designed to bring Polish and Czech iron, steel and coal industries into a single industrial system by construction of jointly-owned factories. Anticipated joint steel output is 4 million tons of steel and 90 million tons of coal per year.

► Some coal operators expect John L. Lewis to ask for a 35-hr portal-to-portal week, $250 vacation allowance and about 40¢ a ton to support the pension plan. If only the latter is granted, it will mean about $1 a ton added to steelmaking costs. If the other items are even partially granted steel costs will go higher. All this does not take into account the ultimate costs of the steel wage negotiations. This week they are still far from settled.

► Steel shortages are resulting in shorter die runs and increased press costs. A large Detroit firm is now using one die setter for every 10 press operators, compared to 1 die setter for every 15 press operators in 1941. The firm insists that the steel shortages have cut the length of die runs by one-third to one-half.

► With the Washington spotlight on defense needs, government studies of steel capacity will be pushed with vigor. Once the organizational work of the National Security Resources Board has been completed, steel capacity is high on its list for thorough study. The Council of Economic Advisers, which has the President's ear on such matters, has intensified its study of the same subject and should submit recommendations soon.

► The announcement of the Bipartite Control Board that the price of ingot steel in the bizone is increased by 66 Reichsmarks is the result of higher coal prices and increased use of high grade imported ores. These prices are currently calculated on a Reichsmark being worth 30 American cents. But the whole price structure in the bizone is to be reviewed soon.

► The outlook for manufacturers of textiles and textile machinery in New England is brighter than some people think. One company, which makes a combing adjunct to textile machines, reports that it will operate at full capacity for the next 2½ years if not another order is taken. Some, at least, are worrying more about obtaining skilled metal working labor than they are about obtaining orders.

► Last year's wild enthusiasm over oxygen in the steel industry has been replaced by cold, scientific thinking, but interest is still hot. Last week Wheeling Steel announced it would install a 135-ton-a-day generator for open-hearth use. Next door, Weirton Steel is putting in a new unit primarily for its blast furnaces--which leaves the matter of the most efficient place to use oxygen still up in the air.

► A sudden spurt in demand for cold finished bars has forced at least one major producer to go back on an informal allocation setup for this product. This demand is thought to be the result of the mild war hysteria sweeping through some of the industry.

Oxygen Enrichment of

The possibility of increasing melting temperatures, reducing initial melting time and boosting melting rates generally through the use of an oxygen enriched blast in cupola operations is suggested in this report of a series of test runs on gray iron. The author compares cupola runs with and without enrichment and discusses the effect of oxygen additions on temperatures, lining life, metal analysis, and results obtained with intermittent enrichment.

RECENT advances in methods of producing quantity oxygen at low cost have spurred investigations into new uses for this gas. The primary metallurgical interest shown thus far has been in such volume uses as the blast furnace and the open hearth. Since the gray iron cupola bears at least a family relationship to the blast furnace, it seems logical to examine the effect of enrichment of the cupola blast with oxygen, particularly if we consider the results reported by I. Langmuir[1] as having been claimed by Kapitza for Russian tests on blast furnace production of pig iron.

The story of oxygen production has been previously reported.[2, 3, 4, 5] Changes in technique have made large volume production of oxygen so inexpensive that it may be attractive in many new applications. Prices of the order of 4 pct of the amount now charged for high purity oxygen have been discussed.[2] Discussion of these prices, however, implies that the equipment required for such low cost production must produce many millions of cubic feet of oxygen a day to be practical.

The requirements for a foundry with five cupolas in normal operation would be in the order of 20,000 cu ft per hr for each percent of enrichment. In addition, the use of cupola melting is normally restricted to relatively short campaigns. Usually melting is restricted to a single shift or at the most two shifts. This in turn would reduce the possibility of using a separate oxygen plant and favor purchase of oxygen from a commercial source.

The decision to run tests on the effect of oxygen in the cupola, was made as a consequence of the results reported on steelmaking. Langmuir[1] credits Kapitza with stating that a blast furnace supplied with oxygen (concentration not given) will produc from 5 to 6 times as much per day as when operated on air, although the temperatures are not as much as 100° higher, and there is no serious difficulty with the refractory materials used. Also of interest in Langmuir's report is the mention of bessemer blows in one-fifteenth the normal time, by the use of oxygen.

Information on the use of oxygen in open-hearth work is reported by Slottman and Kerry,[6] where again the reported improvements in production are most attractive.

Current reports on all of the above usages are somewhat less attractive, primarily because of refractory difficulties and secondarily because (in the case of bessemer converters) of the loss of control.

In the light of the reported tests on steel, it was hoped that enough information could be secured on a limited program of cupola work to at least indicate possible performances to be expected, and, if results were good, to indicate the best direction for future effort.

A rather simple operational program was planned with the hope of obtaining as much of the following information as possible.

(A) The effects of oxygen enrichment on melting rate, both when used intermittently, and when used continuously.
(B) The effect on time from "blast-on" to first tap.
(C) Changes in metal temperature, with particular reference to the first tap.

the Cupola Blast

By A. K. HIGGINS
Research Dept.,
Allis-Chalmers Mfg. Co.,
Milwaukee

(D) Effect on metal composition.
(E) Refractory losses.
(F) Cake consumption.
(G) Overall desirability from a csot standpoint.

The first concern in setting up the tests was to obtain an adequate supply of oxygen to permit use at whatever rate seemed necessary. The normal piping system which supplies oxygen to the major points of use throughout our plant is located at some distance from the foundry and its use would have necessitated an additional pipe line. Through the cooperation of the Linde Air Products Co. oxygen was supplied by one of Linde's Driox oxygen trucks, the liquid oxygen being piped directly from the truck to a vaporizer. The resultant oxygen gas was then passed through a regulator into the air duct between the cupola blower and the bustle pipe.

The rate of oxygen consumption was measured by use of an orifice plate and manometer and later (and far more satisfactorily) by a metering pump on the liquid side of the regulator.

A pitot tube in the airline measured the total flow of air to the cupola. Provisions were made for gas sampling from the bustle pipe and at the top of the charge. Temperatures were measured at both locations.

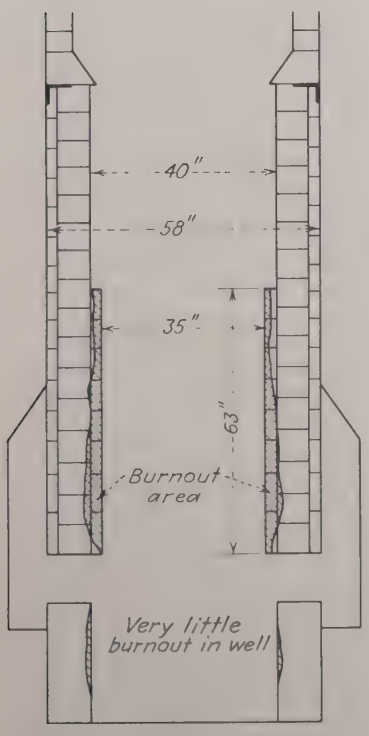


FIG. 1 - Extent of burnout in normal heat, without oxygen enrichment. See table I.

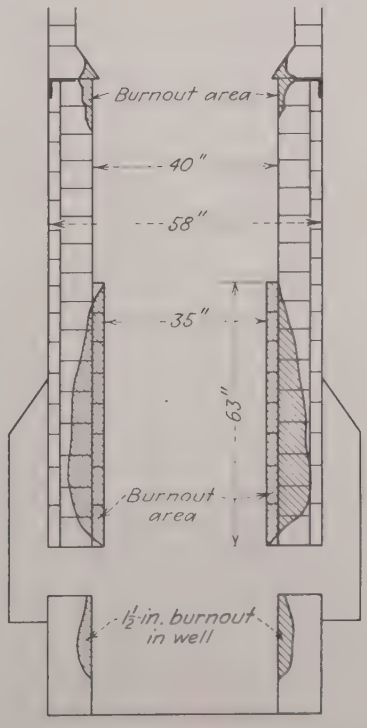


FIG. 2 - Extent of lining burnout in first run with oxygen enriched blast. See table II.

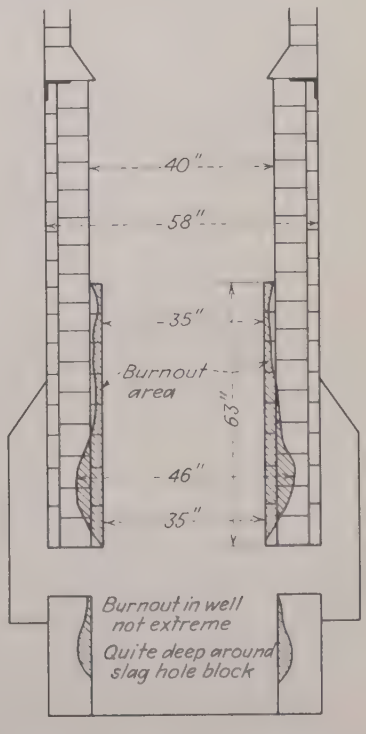


FIG. 3 - Lining burnout resulting in second test run with oxygen enrichment.

The operating conditions chosen were those for a regular production run of low silicon content, synthetic pig iron for use in producing a special type of casting. Table I gives the pertinent operating data of a pilot run made without added oxygen, to serve as a standard for the first oxygen run. The conditions used vary from normal operating practice in that the bed is higher than usual, and the silicon in the charge is low. The objective was to secure a metal high in carbon and low in silicon.

Notice particularly the low temperature of the first tap (2660°F), the time from blast-on to first tap (50 min) and the melting rate for the first hour (4500 lb). This run served as a pilot or standard of comparison for subsequent operations. The iron produced was satisfactory for the purpose intended and the operation was considered normal in every respect.

The second run was as nearly identical to the first as possible with the exception of the oxygen addition. Since previous investigators have found maximum changes in performance in the lower ranges of oxygen enrichment, and since we did not wish to make too radical a change from normal practice, we chose to make the first test with total oxygen in the neighborhood of 24 to 26 pct which represents an enrichment of about 4 pct.

No special precautions were taken to mix the oxygen with the air stream. A 2-in. pipe was welded into the wall of the 14 in. air duct, between the blower and the bustle pipe at right angles to the duct axis. Since there was a large amount of turbulence in the bustle pipe and tuyeres, it was believed that mixing would be adequate. No attempt was made to reduce the air flow to compensate for the volume of the added oxygen, since the supply was from a positive displacement blower driven by a constant speed motor.

Pertinent data from the log of this heat are shown in table II. It may readily be seen that metal temperatures have increased by more than 100°F, and that the effect of the oxygen has carried over into the second hour of operation.

TABLE I

Pilot Run Without Enrichment—36-in. Cupola

Coke: Bed depth—65 in. Weight—2300 lb
Split weight—400 lb

Charge: Steel rail ..... 1200 lb
Low Silicon pig ..... 300 lb
Ferro phos. ..... 25 lb
1525 lb

Melt Analysis

Ladle	1	2	3	4	5	6	7	8
Carbon (Total)	3.40	3.44	3.30	3.28	3.65	3.58	3.51	3.31
Silicon	0.38	0.42	0.42	0.36	0.37	0.40	0.35	0.36
Manganese						0.43		

Blast Volume (est.) 433 cfm

Gas at top of charge: Composition from previous run

CO_2	6.40
O_2	1.70
H_2	0.70
CO	19.10

Temperature at top of charge 1100°F

Time to 1st tap	50 min
Melt 1st hour from blast-on	4500 lb
Melt per hour—total time	7440 lb
Temperature of 1st tap	2660°-2830°F
Maximum temperature	2870°F
Average temperature	2830°F

TABLE II

Oxygen Enriched Run—36-in. Cupola

Coke: Bed depth—66 in. Weight—2025 lb
Split weight—400 lb

Charge: Steel rail ..... 1200 lb
Low silicon pig ..... 300 lb
Ferro phos ..... 25 lb
1525 lb

Melt Analysis

Ladle	1	2	3	4	5	Calc.
Carbon (Total)	3.73	3.47	3.41	3.86	3.47	3.04
Silicon	0.86	0.92	0.65	0.40	0.41	0.32
Manganese			0.55			

Blast Volume (est.) 4330 cfm plus 300 cfm oxygen for first hour—balance of operation 4330 cfm air without added oxygen
Composition (first hour).....25.5 pct oxygen (avg.)

Gas Composition at top of charge:

CO_2	11.65
O_2	0.10
H_2	0.70
CO	23.10

Temperature (max.) 1400°F

Time to 1st tap	39 min
Melt 1st hour (from blast-on)	9500 lb
Melt per hour total time	9360 lb
Temperature of 1st tap	2820° to 2960°F
Maximum temperature	3000°F
Avg. temp. 1st hour (with oxygen)	2960°F
Avg. temp. 2nd hour (without oxygen)	2860°F

In addition, the melting rate has increased remarkably for the first hour after starting the blast, and the temperature of the first tap is very high. Not noted in the data sheet is the fact that the run recorded in table II had a longer soaking period before the blast was started, which would influence the initial behavior to some extent.

Of particular interest in this heat is the silicon analysis of the metal tapped from the cupola. In the run made without oxygen, the silicon content is a few points higher than the computed amount (0.32) and is reasonably constant. The second run (table II) with its higher temperatures has reduced silicon from the slag and has produced a metal relatively high in silicon. Here there is a variation in silicon content from 0.41 to 0.92, the latter figure representing an increase of 0.60, which must have been obtained by reduction from the slag or silicious refractories. This might be predicted from remarks by Kopecki[7] on a paper by Shapovalov who suggests the use of oxygen in the blast furnace to enable production of ferro alloys.

The reduction of silicon is presumably caused by high temperature carbon. The effect of the high temperature is clearly shown by the attack on the cupola wall by the single campaign. Fig. 1 shows the extent of burnout by the normal heat and fig. 2 that caused by the first test run with oxygen. The lining in each case was high duty cupola block.

The melting rate found in the oxygen run was high but every evidence indicated that the coke bed increased during the run to such an extent that by the end of the first hour, the melting rate had decreased because the iron charge was so far from the combustion zone. The high temperatures maintained during the second half of this run after shutting off oxygen are a further indication of the height and temperature of the bed.

It must be deduced from the observations made that conditions suitable for normal operation must be changed to obtain maximum results from the use of oxygen. In the first place, the combustion must be more efficient since less heat is carried off by nitrogen, and temperatures of the coke bed must be considerably higher. Therefore, less coke would be required to melt equivalent amounts of iron. Secondly, since temperatures are higher, a shorter coke bed should provide ample heating and carbon absorption.

The use of less coke in both the bed and the splits should increase the melting rate by bringing the charges closer to the melting zone, and might conceivably result in less melting of the cupola lining by reason of the cooling effect of the iron. Certainly, less silicon should be reduced into the iron if metal temperatures could be lowered.

Table III shows the results of reducing both the height of the coke bed and the size of the splits. The coke bed has been reduced by about 25 pct and the weight of split by 38 pct. If used without oxygen these conditions would be expected to increase the melting rate somewhat and would result in slightly cooler iron. Table III shows that with the intermittent use of oxygen as recorded, the melting rate for the entire run was more than double that of the pilot run, while the amount of metal melted in the first hour after "blast-on" was almost four times as great as the pilot run. In spite of this relatively large increase, the metal temperature during the early part of the run was high as compared with the pilot run.

The high early melting rate had peculiar consequences affecting the balance of the run. Actually, the melting rate was in excess of the rate at which the cupola could be charged. Charging was somewhat hindered by ambient temperatures of -18°F. The metal settled so rapidly in the cupola that the noise of the sliding charge could be heard clearly above the noise of normal operation.

As the run progressed the top of the charge settled rapidly away from the cupola charging door and the succeeding charges fell free, almost to the melting zone.

As the coke bed reduced in depth the iron temperatures dropped and the melting rate was reduced somewhat; however, it still remained about twice that of the pilot run. Temperature of the small coke bed remained high as long as the oxygen enriched blast was maintained, but dropped rapidly as soon as enrichment was halted. This made it necessary to keep oxygen on near the end of the run to prevent freeze-up of the low carbon melt.

The series of analyses of metal from the third run show clearly the effect of reduction in depth of the bed and the consequent oxidation of the metal. The appearance of the metal at the spout indicated oxidation as did the sample blocks. It can be seen that the last tap shows carbon reduced to 1.23 pct and silicon at 0.25 pct, both figures being considerably below the calculated analysis shown in table I.

Fig. 3 shows the amount of lining damage resulting from the second oxygen enriched run, again indicating the extremely high temperatures. Here also, the evidence shows that the bed

TABLE III

Second Run With Oxygen Enrichment—36-in. Cupola

Coke: Bed depth—52 in. Weight—1475 lb
Split Weight—250 lb
Charge: Steel rail ..... 1200 lb
Low silicon pig ..... 300 lb
1500 lb

Melt Analysis

Ladle	1	2	3	4	5	6
Carbon (Total)	3.74	2.62	3.13	3.13	2.43	1.23
Silicon	0.74	0.32	0.34	0.19	0.28	0.25
Manganese	0.54	0.82	.....	.....	.....	.....

Blast Volume (est.) 4330 cfm and oxygen

(A) Blast-on	8:30 a.m.		
(B) Oxygen on	8:35 a.m.		
(C) Oxygen off	9:15 a.m.	oxygen used	9000 cu ft
(D) Oxygen on	9:40 a.m.		
(E) Oxygen off	9:45 a.m.	oxygen used	1700 cu ft
(F) Oxygen on	9:57 a.m.		
(G) Oxygen off	10:13 a.m.	oxygen used	3800 cu ft
(H) Oxygen on	10:20 a.m.		
(I) Oxygen off	10:40 a.m.	oxygen used	5000 cu ft
(J) Blast off	10:55 a.m.	Oxygen total	19,500 cu ft

Gas composition at top of charge: 8:50 a.m.

CO_2	11.90 pct
O_2	0.81 pct
H_2	1.02 pct
CO	24.95 pct

Time to 1st tap ..... 38 min
Melt 1st hour ..... 17,500 lb
Melt per hour (total time) ..... 15,700 lb
Temperature of 1st tap ..... 2640°F-2960°F
Maximum temperature ..... 2960°F
Average temperature ..... 2740°F
Minimum temperature ..... 2640°F (final temp.)

was very low and very hot during part of the run. The depth of burnout in the well may indicate the oxidized and corrosive nature of the slag formed in the later part of the operation. This would seem likely since metal temperatures were not particularly high, except in the initial stages.

It is apparent that higher charging rates would have to be maintained if melting is to be satisfactory with the smaller bed height used, and it might be desirable to increase the size of the coke splits slightly, although ample charging rates with consequent use of heat in preheating of the charge should result in stabilizing the bed and might, as a consequence, allow the use of somewhat less coke in the splits.

It was decided at this time to discontinue special operations involving oxygen and to attempt to evaluate the information obtained from the tests as it related to the original obectives. We will consider these points in the order that they were originally mentioned:

(A) The use of oxygen in amounts of the order of 25 pct total, or 4 pct enrichment, resulted in increased melting rates, amounting to two times or more those found without oxygen additions. When conditions were changed to take advantage of the higher temperatures available, indications were that still greater increases could be expected, although good quantitative data were not obtained. Intermittent use of oxygen seemed very effective and would suggest the continuous use of small amounts as of possible advantage.

(B) The initial melting rate was increased by a considerable amount, since time to first tap was reduced by 20 pct.

(C) The temperature of the first tap was in-

creased by more than 100°F when oxygen was used. While this was of no importance on this particular operation, it may be of considerable importance in production work at somewhat lower coke ratios.

(D) The effect of oxygen enrichment on the composition of the metal used is seen to be serious, at least for the analysis desired in this case. If it can be assumed that the higher bed temperatures found may add as much as 0.5 pct of silicon to the melt, it would seem of consequence for any but the softest of irons.

(E) The refractory losses in the tests are of serious magnitude. Since in each case they seem to be a function of the coke temperature and not of the metal temperature, it is not likely that minor variations in operational use of additional oxygen will benefit this factor. Some reduction of attack would result from limiting total oxygen to 22 or 23 pct and it is possible that such operation might have enough effect on the other variables to be desirable. The use of better refractories is, of course, one way of attacking the problem but, since first quality cupola block was used for all linings on the tests reported, higher quality refractories would add considerably to the cost of operation. It seems unlikely that a single melting campaign could be continued, under the conditions used, for more than 3 hr without complete failure of the lining.

(F) The tests as conducted failed to give any significant information on possible savings in coke.

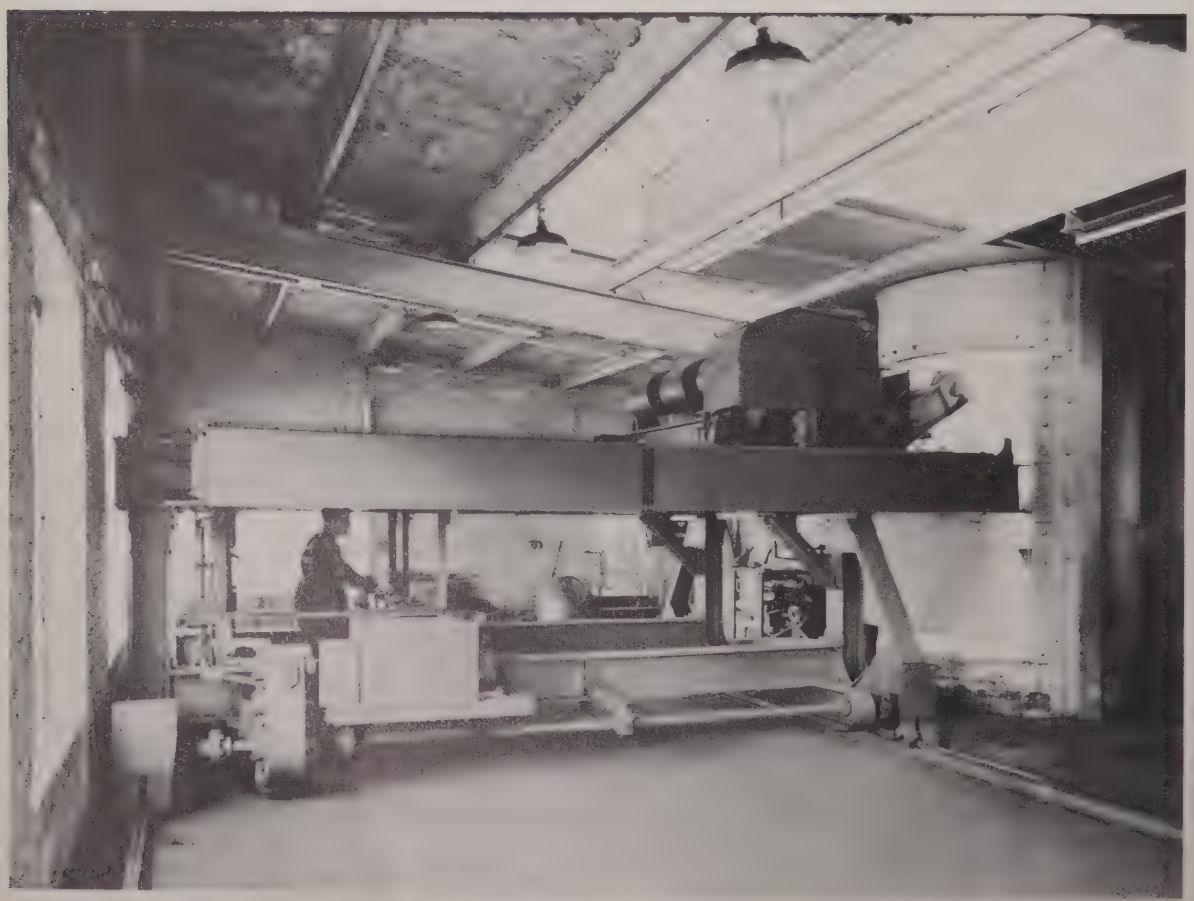
(G) Overall costs were not computed since the rate of refractory failure was so great as to prohibit the practical continued use of oxygen enrichment.

At first glance, it might seem that the results of these tests indicate that the use of oxygen in the foundry is undesirable. We believe, to the contrary, that the limited use of oxygen may prove of considerable value for foundries using continuous molding and casting units. If, as shown by our tests, the addition of small amounts of oxygen (4 to 6 pct) to the blast before the first tap can raise the temperature of the metal and reduce the time, it can be good insurance against idleness of a molding crew.

We have shown a saving of 10 min in the time required to obtain metal at the spout, which would account for an equivalent amount of time saved for each member of the melting crew. This would, of course, not need to result in any savings for the molding crew, since time required for the first tap can be estimated.

In addition to the direct saving of time, we have found that we can increase the temperature of the first tap by at least 100°F, which might well mean the difference between using and pigging the metal. We believe that any shop that has difficulty with cold metal might well consider the use of oxygen.

Equipment for use in this manner should be simple. It would not seem practical to use a



Mechanical charging of a cupola at the Allis-Chalmers foundry.

liquid oxygen tank truck such as was used in these experiments, because the volume of oxygen required would be small, and the cost and difficulty of bringing in and coupling the truck for the few minutes required would be prohibitive.

The amount of oxygen required for this service would be (for a 36-in. cupola) between 1000 and 5000 cu ft. A cylinder and manifold set-up could readily supply oxygen in these quantities at reasonable costs.

The results to be expected from the admission of these small quantities of oxygen would be more rapid availability of metal at the spout and adequately hot metal on the first tap. It would seem wise to limit the number of cylinders on the manifold to the minimum that would produce the results desired, since the use of excess amounts of oxygen would introduce the possibilities of damage to the cupola lining and increase costs needlessly.

The results obtained in these tests can be summarized as follows:

(1)—The use of oxygen under the conditions reported increases melting rate by a large factor.

(2)—Metal temperatures are increased by 100°F or more.

(3)—Initial melting time is reduced.

(4)—The composition of the metal may be altered as a consequence of the reduction of silica to silicon.

(5)—The excessive temperatures resulting from continued use of oxygen are beyond the useful range of normal cupola refractories.

(6)—The use of oxygen as a booster for the first tap of the day's operation seems a desirable possibility.

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1 Irving Langmuir, Chemical and Engineering News, vol. 24, No. 6, March 25, 1946.

2 "Oxygen Past, Present, and Prospects," Chemical Engineering, vol. 54, No. 1, January 1947. See also "Low Cost Oxygen for Metallurgical Uses," The Iron Age, July 17, 1947, p. 49.

3 "Air Separation, Principles and Technology," Chemical Engineering, vol. 54, No. 3, March 1947.

4 E. P. Stevenson, "Oxygen Generation," vol. 121, No. 16, Oct. 20, 1947.

5 E. P. Stevenson, "Oxygen Generation," Steel, vol. 121, No. 17, Oct. 27, 1947.

6 G. V. Slottman and F. G. Kerry, "Oxygen in the Open Hearth," Steel, vol. 119, No. 23, Dec. 2, 1946.

7 E. S. Kopecki, "Oxygen in Steelmaking," The Iron Age, vol. 158, No. 22, Nov. 28, 1946.

German Wartime Casting Techniques

PROCEDURES and equipment used in casting steel, aluminum, magnesium, brass and bronze in Germany during the war years are described in a series of Office of Technical Services reports based on investigations by American and British specialists. Mimeographed copies of the reports, which are briefly abstracted below, can be ordered, giving the "PB" identification numbers, from the Office of Technical Services, Department of Commerce, Washington 25, D. C.

Centrifugal Casting—Production items, melting equipment, type of metal, casting machines, pouring devices, spinning speed and time, molds, facing and machining allowances used in nine plants, constituting about 65 pct of German centrifugal casting industry, are described. *PB-1249; 75¢; 24 p.*

Aluminum Casting—Production methods employed in 10 plants for the melting and casting of aluminum alloy billets and slabs for hot extrusion and hot rolling are described. *PB-19276; 50¢; 17 p.*

Light Alloy Foundries — Plants, production methods and laboratory testing equipment of four aluminum, magnesium and brass foundries are reported on. *PB-20086; 75¢; 22 p.*

Continuous Casting—Description of the continuous casting process as used for aluminum, magnesium, brass and zinc, and a list of the companies operating under a patent pool agreement are given. *PB-44938; 50¢; 9 p.*

Light Alloy Diecasting—Machine tools for diesinking, production methods, machinery and plant layouts for diecasting light alloys are discussed by a British investigating team. *PB-44949; 50¢; 12 p.*

Ingot Molds—Manufacture and performance of molds for steel ingot casting are reported on. Drawings and photographs illustrate equipment and methods, and tables of stripping times and other mold data are included. Brief discussions of deep drawing steel, seamless tube steel and other special steels are given. *PB-49219; $3.25; 127 p.*

Steel Castings — Melting, molding and pouring techniques used by 18 representative steel casting foundries are described. Tables summarizing economic and engineering information are included. *PB-1333; $4.00; 149 p.*

Steel Foundries—British report describes production practices in 15 steel foundries. Layouts, equipment and special techniques are discussed. *PB-18916; 75¢; 29 p.*

Mold and Core Blackwashes — Selection of proper blackwashes for sand mold protection is discussed, the requirements for blackwashes by different metals and alloys and other information is given. *PB-40348; 50¢; 15 p.*

Nickel Anode Casting—Melting types of furnaces and crucibles, pouring temperatures, rates of cooling and purity precautions in the production of cast nickel anodes are described. *PB-44963; 50¢; 17 p.*

German Silver Casting—Composition, melting and casting of german silver alloys is described. Table giving the composition of 171 proprietary and special german silver alloys is included. *PB-47008; 75¢; 23 p.*

Casting Bronze — Suggestions for reducing porosity and blow holes in bronze castings are given, and common melting and pouring practices are analyzed. *PB-44957; 50¢; 15 p.*

AFA President - Max Kuniansky, vice-president, Lynchburg Foundry Co., Lynchburg, Va.

AFA Vice-President - W.B. Wallis, president, Pittsburgh Lectromelt Furnace Corp., Pittsburgh, Mr. Wallis has been nominated to serve as AFA president for 1948-49.

. . . Foundry Show to Stress

MANY new and improved production techniques and equipment will feature the 52nd annual convention of the American Foundrymen's Assn. to be held in Philadelphia May 3 to 7.

With 60 meetings scheduled for the technical sessions and some 250 exhibitors participating in the equipment show in the Convention Hall, the convention promises to be one of the largest and most instructive meetings ever staged by the AFA.

The 60 convention meetings to be sponsored by various AFA divisions and general interest committees will include round table and shop course sessions. Three lecture courses are also scheduled, covering quality control, sand practice and gray iron practice. Progress reports on AFA-sponsored research in fundamental problems of foundry technology will be presented by a number of special committees.

The equipment exhibition is expected to include a number of true postwar designs since, at the last exhibition in 1946, many manufacturers had not had sufficient time to design and produce their newest ideas in modern foundry equipment.

One of the highlights of the business sessions of the convention will be the awarding of medals in recognition of outstanding contributions to the foundry industry. Egbert H. Ballard, Swampscott, Mass., has been named to receive this year's William H. McFadden gold medal. R. G. McElwee, iron foundry division manager for Vanadium Corp. of America, Detroit, will be awarded the John A. Penton medal, and Peter E. Rentschler, president-treasurer of Hamilton Foundry & Machine Co., Hamilton, Ohio, will receive the Peter L. Simpson medal. AFA president, Max Kuniansky, vice-president-general manager of Lynchburg Foundry Co., Lynchburg, Va., will be honored for his leadership of the 10,000-member association in 1947-48. The awards will be presented at the annual banquet on May 7.

The annual business meeting will see new officers for 1948-49 installed. The president-elect is William B. Wallis, president, Pittsburgh Lectromelt Furnace Corp. Edwin W. Horlebein, president, Gibson & Kirk Co., Baltimore, has been named vice-president.

Condensed Program of AFA Annual Meeting, Philadelphia, May 3-7

MONDAY, MAY 3

8:30 a.m.—Registration begins. Exhibits open.
10:00 a.m.-12:00—Technical sessions—Educational: Aluminum and Magnesium.
12:00 Noon—Brass and Bronze Roundtable Luncheon.
2:00-4:00 p.m.—Technical sessions—Aluminum and Magnesium: Malleable.
4:00-6:00 p.m.—Technical sessions—Brass and Bronze.
5:30 p.m.—Registration closes. Exhibits close.
6:30 p.m.—Educational Dinner.
8:00-10:00 p.m.—Technical sessions Gray Iron Shop Course: Sand Shop Course.

TUESDAY, MAY 4

9:00 a.m.—Registration opens. Exhibits open.
10:00 a.m.-12:00—Technical sessions Aluminum and Magnesium: Malleable.
12:00 Noon—Aluminum and Magnesium Roundtable Luncheon. Malleable Roundtable Luncheon.
2:00-9:00 p.m.—Philadelphia Day.
2:00-4:00 p.m.—Technical sessions—Brass and Bronze: Pattern: Heat Transfer.
5:30 p.m.—Registration closes.
7:00 p.m.—Chapter officers and directors dinner.
8:00-10:00 p.m.—Technical sessions—Plant and Plant Equipment: Gray Iron Shop Course: Sand Shop Course.
9:00 p.m.—Exhibits close.

WEDNESDAY, MAY 5

9:00 a.m.—Registration opens.
9:30-10:15 a.m.—Annual business meeting.
10:15-12:00—Charles Edgar Hoyt annual lecture.
11:00 a.m.—Exhibits open.
12:00 Noon—Pattern Roundtable Luncheon: Engineering School Graduates Luncheon.
2:00-4:00 p.m.—Technical session—Refractories.
4:00-6:00 p.m.—Technical session—Sand.
5:30 p.m.—Registration closes. Exhibits close.
7:00 p.m.—Canadian Dinner.
8:00-10:00 p.m.—Technical sessions—Gray Iron Shop Course: Sand Shop Course: Refractories.

THURSDAY, MAY 6

9:00 a.m.—Registration opens. Exhibits open.
10:00 a.m.-12:00—Technical sessions Job Evaluation and Time Study: Gray Iron: Steel.
12:00 Noon—Steel Roundtable Luncheon.
2:00-4:00 p.m.—Technical sessions—Cost: Gray Iron.
4:00-6:00 p.m.—Technical sessions—Job Evaluation and Time Study: Sand.
5:30 p.m.—Registration closes. Exhibits close.
8:00-10:00 p.m.—Technical sessions—Gray Iron Shop Course: Sand Shop Course.

FRIDAY, MAY 7

9:00 a.m.—Exhibits open.
10:00 a.m.-12:00—Technical sessions—Gray Iron: Steel.
2:00-4:00 p.m.—Technical sessions—Gray Iron: Steel.
4:30 p.m.—Registration closes. Exhibits close.
7:00 p.m.—Annual Banquet.

New Methods and Equipment

AFA Medalists

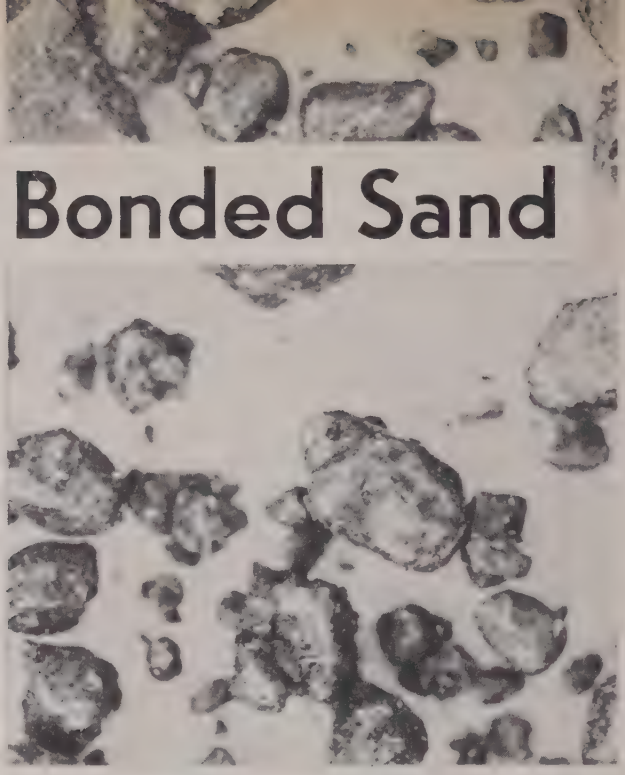
Will be awarded gold medals in recognition of outstanding contributions to the foundry industry.

R.G. McElwee, Vanadiam Corp. of America, awarded the John A. Penton medal.

E.H. Ballard, awarded the William H. McFadden gold medal.

P. E. Rentschler, president, Hamilton Foundry & Machine Co., recipient of the Peter L. Simpson medal.

Chemically Bonded Sand



Micrograph showing typical appearance of chemically bonded sand.

SILICA sand bonded with clay has been basic in the foundry industry for many hundreds of years. It was rather startling when, three years ago, B. M. Weston announced the development of a new moldng refractory and bonding action based on the chemical treatment of carbon.

After an extensive period of research, the original process was modified anl improved until in January 1947, the first commercial application was considered possible. At that time, the Lynchburg Foundry Co. was shipping approximately 135 tons of castings a day from their mechanized unit at Lynchburg, Va. Orders were piling up and every ton of castings was vital. Under these conditions, it took real courage and foresight when on January 19, 1947, this company cleaned out the entire 150-ton sand system, replaced it with chemically coated sand and started to produce castings using the new molding process.

In April 1947, the process was tried in two automotive foundries, and three months later was accepted as being commercial. Since that time, the Lynchburg Foundry Co. has extended the use of chemically treated sand and has been joined by 12 large mechanized foundries that have adopted this practice as commercial. Approximately 2000 tons a day of castings are being produced in chemically bonded sand.

In order to reduce the cost of the refractory resin used in the chemical-bond process, the resin is applied as a coating on silica sand grains; the sand furnished the bulk of the system at a low cost. The molding characteristics are controlled by surface effects and there is no contact between molten metal and the silica grain. The coating eliminates many of the undesirable characteristics of silica refractories but retains many of the expansion characteristics. The coating is essentially carbon although it differs markedly from carbon in the form of graphite or coal. It is a non-thermalsetting hydrocarbon plastic.

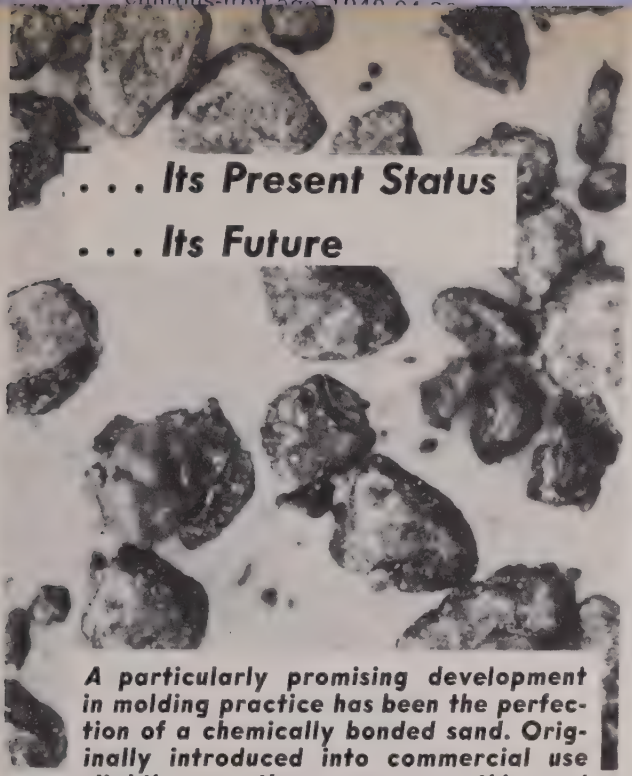
The refractories of the coating is a partial explanation of the new molding technique. The more interesting feature is the fact that this coating may be activated by chemical treatment so that cohesiveness is developed. The tackiness gives a bonding action even in the absence of clay and water. It is possible, through the chemical bonding action, to eliminate both clay and water; such was the original process. However, to achieve economy and ease of operation, the original development was modified so that in the present process about half of the bonding action is developed by chemical treatment and the other half comes from the usual action of clay and water.

The combination of chemical bond and clay bond presents unusual characteristics and working properties. Some of these effects are related to the chemical system and others are the indirect results of changes in the clay-water system. The best way to describe these characteristics is by quoting from the report issued by Lynchburg Foundry Co. and then discussing the changes that have taken place since that time.

The Lynchburg report stated that "Time necessary to prepare the sand in the mullers has been reduced and more sand can be supplied to the molding machines."

The above statement is still true because less clay and water are used in the system and also because the chemical treatment helps to activate and distribute the clay bond. In some foundries, however, it was not possible to reduce the mulling time because the previous cycle was extremely short and inadequate for synthetic sand. The same cycle proved adequate for the new sand and therefore better operation was obtained in the same length of time.

"The chemically treated sand has better flowability characteristics than any synthetic sand



. . . Its Present Status
. . . Its Future

By T. BARLOW
Eastern Clay Products, Inc.,
Jackson, Ohio

A particularly promising development in molding practice has been the perfection of a chemically bonded sand. Originally introduced into commercial use slightly more than a year ago, this sand is now being used in 12 large mechanized foundries producing some 2000 tons of castings daily. In the timely report presented herewith, the author reviews experience to date with this sand and tells of plans for extending its use to steel, bronze and brass molding and core rooms, as well as smaller shops.

previously used. The improvement in this property enables the mold to be made with a higher and more uniform hardness throughout, with fewer jolts of the molding machine and less ramming," the report further stated.

This outstanding characteristic of chemically-treated sand is influenced by the 50 pct reduction in clay content and low moisture, but it is controlled by the refractory coating and the action of the chemical treatment. In the absence of pressure, the cohesiveness or tackiness of the sand does not interfere with flowability; there is no gummy feeling. The bond is developed only when the coated grains come in direct contact with each other under pressure. For this reason, the sand handles well in the sand system and a great deal of trouble has been avoided in elevators, hoppers and sand belts.

One of the advantages of high flowability is the effect on dimensional tolerance. It has been found that (particularly in large work) the new molding system gives castings that conform more accurately to pattern dimension. Small swells and strains are reduced or eliminated. In many operations a weight reduction, through the elimination of swells and strains, offers a valuable saving.

"The toughness of the chemically treated sand can be increased to a specification which will mold on all of the current patterns without affecting its good flowability properties. In other words, a tough, highly-flowable sand is now possible, two properties which in most sands are not compatible," the report also pointed out.

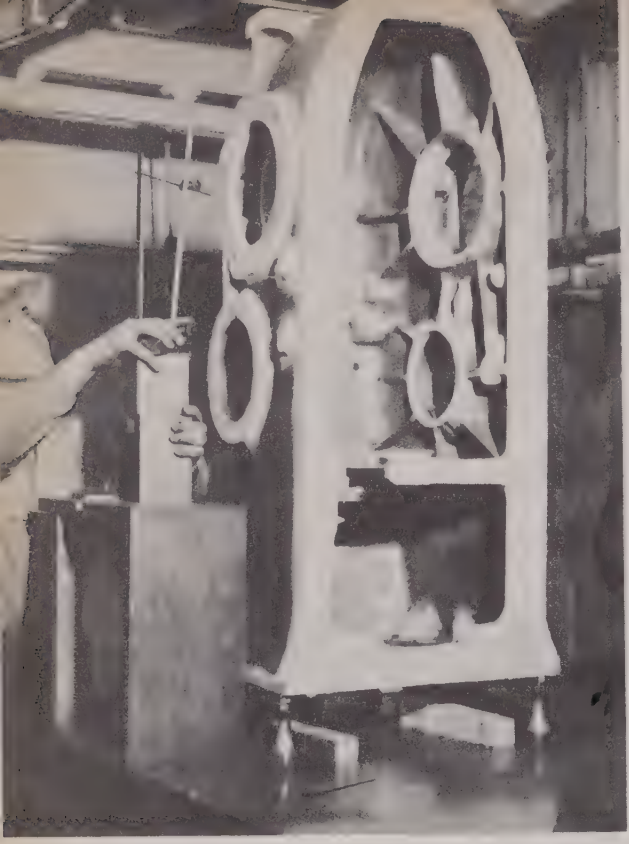
The expression "toughness" may be misleading because the new sand does not show high deformation values on testing equipment. However, the sand does permit deep, intricate lifts and a workability which is unusual with a flowable sand. This effect is the result of a high ratio of tensile and shear strength to green compression. Toughness in the ordinary sense of the word may be developed in these sands by the introduction of such materials as cereal. About 20 pct of the foundries now use a small amount of high-deformation binder for some patterns, but the majority of the work is being done without such aids. The combination of tensile strength and flowability seems to be satisfactory for the majority of the work.

"High strength, or high toughness, whichever is desired, can be developed in the chemically treated sands at much lower moisture contents. Here again, a third incompatible arises, namely, a tough, high-flowable sand at a low moisture content," according to the Lynchburg Report.

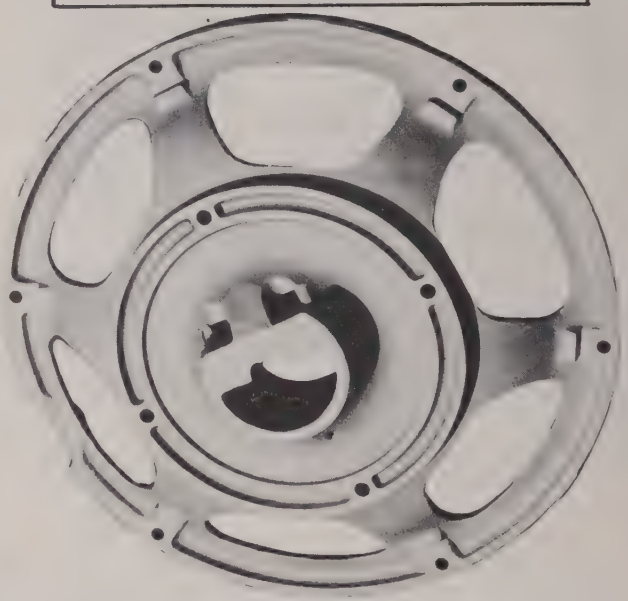
Low moisture is possible because of the low clay content. Some of the systems are now operating well below 3 pct moisture but the average is approximately 3 pct. In spite of the low moisture, the sand has a normal feel, and gives the impression of being at temper.

The low moisture content is an advantage and a disadvantage, depending upon the viewpoint. It is a major advantage from the standpoint of gas evolution and requirements for venting the mold. Less water vapor and mold gas during pouring permits less permeable sands and therefore, finer finishes through the use of fine sands. Low moisture is somewhat more difficult to control but does not present a major problem.

The Lynchburg Report also pointed out that, "By virtue of the use of a finer grained sand with good flow properties and lower permeability requirements, it is possible to extend the use of a single sand over a wider range of castings. The manner in which the refractory carbon resin is distributed around each grain, and the time of the mold gas formation, imparts almost the same cleaning action to a thin, light casting as is ob-



Typical castings produced with clay bonded sands. Data on these castings are, left to right, weight 650 lb., ½-in. wall to 2-in. around bosses; weight 251 lb, 36-in. diam, 1¼-in. section; weight 38 lb; weight 353 lb, section is 3/8 to ½-in. wall; weight 110 lb, 18-in. high, fins cast in green sand cope. All castings were produced by Lunchburg Foundry Co.



tained on a heavy, thick-sectioned casting. This property has provided the means to eliminate facing operations entirely and increase the mold production proportionately."

The work described above ranged from less than 1 lb. to over 500 lb. Since that time, the use of chemically-treated sand has been extended to smaller castings and to castings weighing over 4000 lb. The same conclusions are still true, namely that a wider range of work can be produced from a given grain size of sand. Even the 4000 pound castings are being produced in sands of approximately 70 AFA fineness while the lighter work (with the exception of aluminum castings which are using 100 AFA fineness) are operating at 80 to 85 AGA fineness or lower. Therefore, in foundries making a wide range of work, a single sand is used for all castings.

Elimination of the facing has not been universally true but there has been a definite reduction in the number of facing sands used. Only a few patterns require facing; the facing is not to change the fineness of the sand but rather to change the expansion characteristics. In one shop where 10 to 15 different facing mixes were required to control scabs and buckles, chemically-treated sand requires only one facing mixture. The system sand is sufficiently versatile for most work. The single facing mix protects the unusual or extremely difficult patterns. The facing mix contains only system sand, extra plastic carbon and the addition of anti-expansion binder.

"Lumping has been largely eliminated. At no time during the continued production run of the chemically-treated sand was there evidence of any degree of lumping. This has had a threefold effect: (1) The shakeout sand returning to the mullers is in a much better condition for remixing; (2) the refuse sand has been limited to pieces of broken cores, which can be considered as a normal waste unless special reclamation equipment is available; and (3) the better surface finish of the casting."

Although some of the chemically-treated sand systems use combinations of clay to develop maximum versatility, most of the operations use only the chemical treatment and bentonite. Chemically-treated sands with their low clay contents do not show the normal difficulties with shakeout. Furthermore, the shakeout characteristics can be controlled by the judicious proportioning of the chemicals used. This is one of the principal differences between a chemically bonded sand and the liquid seacoals or seacoal replacements.

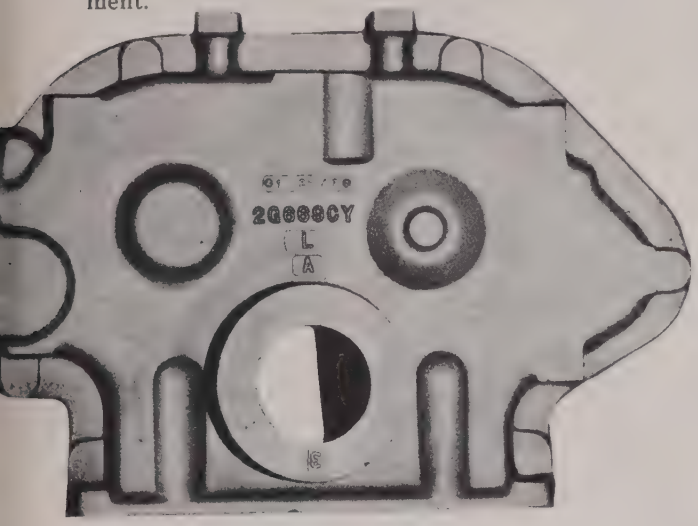
"Bond and cereal additions at the mullers have been reduced with the processed sand. Average additions of 3.4 lb bentonite and 1.4 lb cereal flour to an 1100-lb batch of synthetic sand have been reduced to 1.7 lb bentonite and zero to 0.3 lb maximum of cereal flour. Seacoal, pitch and other dry carbonaceous materials have been entirely eliminated," the Report explained.

Reduction in Cleaning Cost

"In general, there has been a reduction in cleaning time with the use of chemically treated sand, some castings being affected more than others. Sand blast time has been cut as much as 50 pct in some cases, and substantially reduced for all castings. The subsequent grinding, for appearance, of areas having metal penetration due to lack of flowability also has been reduced."

In most of the operations, the reduction in cleaning time has been a major item. This, combined with the use of finer sand, has permitted the production of smoother, better looking castings with cleaning room cost reductions of up to

40 pct. This effect is primarily due to the refractoriness of the system and the fact that the low-fusion products of iron oxide and silica are eliminated. This feature has been particularly important where there have been insufficient cleaning room facilities and therefore a bottleneck in the foundry operation. For example, at Lynchburg Foundry Co., such a bottleneck prevented the foundry from producing more than 135 tons of castings per day. At the present time, the same foundry is producing up to 360 tons per day with essentially the same cleaning room equipment.



The original report claimed the total savings for the chemically-treated sand to be $618 per day, based on 150 tons of castings. It added, "from this must be deducted the additional cost ($350) of the chemically treated sand, leaving net daily savings of $268."[1] Since this statement was made, further development work provided new techniques and a new chemical reagent so that now the chemically-treated sand costs are distinctly lower than these.

The early use of chemically-treated sand was restricted to large mechanized units including gray iron, malleable, and aluminum. Application of the same basic process is being developed for steel, brass and bronze. This development is expected to mature shortly although it has been retarded because of the obvious necessity for developing more complete knowledge on the present applications.

The most recent development has been the extension of the process to non-mechanized and semi-mechanized units. These applications use about the same technique except that facing sand is necessary to provide a mechanism for mulling and retreating the sand. Chemically-treated sand is used as the basic heap for the system. Part of the heap is activated and rebonded in a muller and introduced as a facing. In this way all of the chemical is introduced in the facing muller together with whatever clay is necessary. The heap sand is maintained by the usual technique of letting the used facing fall into the system at the shakeout. This technique provides all the advantages of chemically-treated sand with the exception, of course, of the elimination of facing.

Among the most recent interesting developments is the use of this material for skin-dried and baked molds and for green sand and black-sand cores. Skin-drying is accomplished by spraying the surface of the mold with the same resin-chemical combination used for maintaining and activating the system. This provides a hard surface when skin dried and is used for special patterns which would give difficulty in green sand molding.

Special techniques are being developed, and have reached the semi-commercial stage, to extend the chemical bonding process to the core room. The commercial use of chemically-treated sand in the core room is expected in the very near future and will permit foundries using chemically-treated sand to have free exchange of sands between the core room and molding floor. This technique will not only involve further cost reductions in the system but will also provide for the best possible operation of the chemically-treated sand because the core shakeout will carry the proper coating for maximum utility in the molding system. Research and development with this new technique in foundry practice is continuing at an accelerated rate.

References

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2 Thomas W. Curry, "New Process Chemically Treats Molding Sand," American Foundryman, June 1947.

3 William G. Gude, "Chemically Coated Molding Sand," Foundry, May 1947.

Gray Iron Foundry Modernized

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Intensive mechanization of processing operations, coupled with modern material handling techniques and effective dust control equipment, characterize the modernized gray iron foundry of Crompton & Knowles Loom Works, described in this article. This program, which has resulted in the development of an efficient shop, with good working conditions, exemplifies what can be accomplished in profitable modernization of foundry operations.

WHAT has been popularly termed a "push-button" foundry is rapidly emerging on the site of a much older foundry as an important part of an extensive modernization at the Crompton & Knowles Loom Works in Worcester, Mass. Although old timers can still recognize portions of the walls, floors and roof of former days, a glance at interiors and the latest in new equipment makes apparent a revolutionary change toward the last word in modernity that is rapidly being achieved.

Production has been continuous despite extensive alterations that are not yet completed but most of the second floor, on which nearly all molding and casting will be done, is now making the most of mechanical equipment of the latest type and much new sand and other handling equipment appears on other levels. There is near elimination of dust in areas already modernized and this, together with a well arranged system of ventilation, cooling tunnels and mercury-vapor plus good natural lighting makes working conditions excellent.

New handling facilities have practically eliminated heavy lifting and nearly all molding is or soon will be done on squeezer or roll-over ma-

FIG. 1 - Foundry control sheet showing the factors which are checked to insure uniformity of melting operations.

FOUNDRY CONTROL SHEET

CUPOLA NO. NO. 1 MIXTURE REGULAR IRON

DATE	OUTSIDE TEMP	HUMIDITY	MET. TIME MATT	DEL. T MAT. IRON	TEMP T. IRON TEMP	BLAST PRESSURE	BLAST PRESSURE	TIME FOR FIRST IRON	SULPHUR	SILICON	TRANSVERSE LOAD	TRANSVERSE DEFLECTION	IMPACT AVERAGE	LB. PER SQ. IN. TENSILE STRENGTH	B.H.N.	TIME FOR BLAST	LB. OF AIR PER MIN.	CU. FT. AIR PER MIN.	BLAST GATE OPENING INCHES	GRAINS OF WATER IN ATMOSPHERE	WEIGHT OF BED	TOTAL TONNAGE	MANGANESE	TOTAL CARBON		REMARKS
7-1-47	92°	48%	10.10	2760	2720	31 oz	10 oz	8 MIN	0.113	2.70						11:59		5450		6.7	70°	32½ TON	0.63	3.28		CUPOLA DIAM. 52 IN., FIRST IRON DOWN 8 MIN.
7-2-47	79°	36%	9.96	2760	2720	35 oz	11 oz	8 MIN	0.108	2.35	2440	0.270	14 15	32,200	2.2	11:52		5450		4.0	70°	32 TON	0.90	3.35		9 MIN. BLAST FOR COKE FIRE, 1ST CHARGE TO BLAST ON 42 MIN.
7-3-47	78°	29%	9.99	2780	2720	33 oz	10 oz	7 MIN	0.131	2.55								5450		3.2	70°	29 TON	0.83	3.24		2600 LB COKE ON BED, 275 LB COKE PER CHARGE
7-7-47	78°	44%	9.80	2740	2680	28 oz	15 oz	10 MIN	0.121	2.68								5400		2.8	70°	28½ TON	0.84	3.25		CUPOLA DIAM. 58 IN., FIRST IRON DOWN IN 10 MIN.
7-8-47									0.099	2.72													1.01	3.32		
7-9-47									0.116	2.65	2500	0.250		32,000									0.84	3.18		
7-10-47									0.128	2.48													0.78	3.05		
7-11-47									0.111	2.74													0.95	3.31		
7-14-47	92°	34%	9.70	2740	2720	29 oz	12 oz	9 MIN	0.146	2.53								5400		5.5	72°	29½ TON	0.91	3.20		9 MIN. BLAST FOR COKE FIRE, TEMP OF IRON GOOD CUPOLA DIAM. 52 IN., FIRST IRON DOWN 9 MIN
7-15-47	91°	45%	9.13	2760	2720	30 oz	10 oz	9 MIN	0.146	2.63								5400		7.1	68°	27 TON	0.82	3.20		FIRST IRON DOWN 9 MIN. CUPOLA PREHEATED 55 MIN.
7-16-47	86°	50%	9.66	2760	2720	33 oz	13 oz	8 MIN	0.143	2.48	1810	0.150	12-12	36,700	217	11:56		5400		6.8	66°	30½ TON	0.79	3.08		9 MIN. BLAST FOR COKE FIRE, 2810 FT COKE ON BED 275 LB COKE PER CHARGE

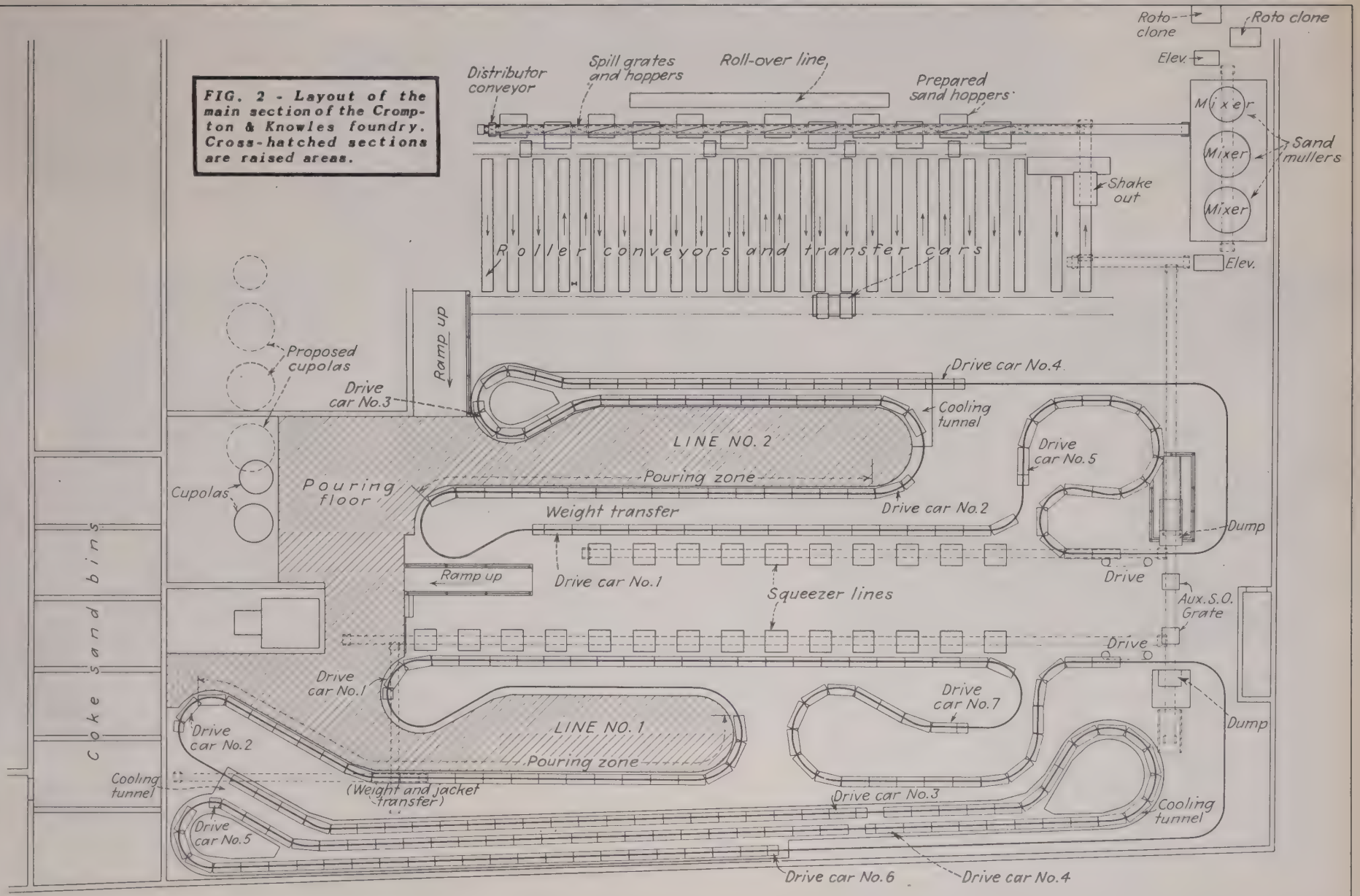


FIG. 2 - Layout of the main section of the Crompton & Knowles foundry. Cross-hatched sections are raised areas.

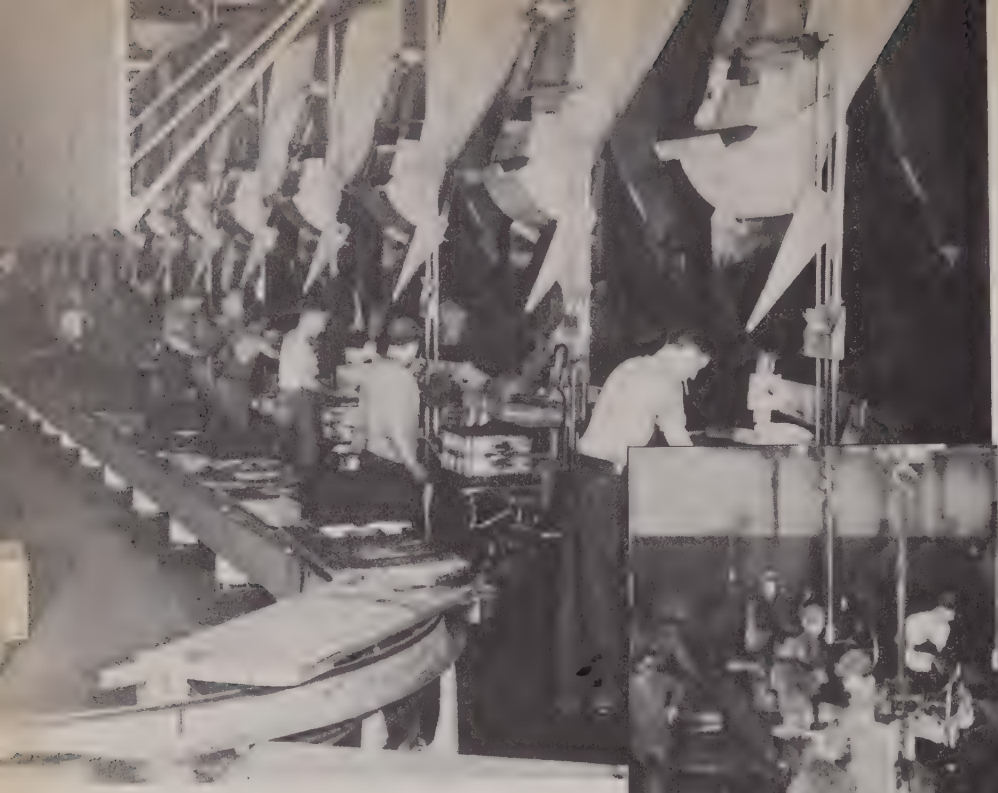


FIG. 3 - Looking down two rows of squeezers, each of which is served by conveyer trains. Each molding machine is set on a grating through which excess sand falls.

FIG. 4 - Pouring a trainload of molds from trolley ladles. A cooling tunnel is in the background.

chines. On the main molding floor, fig. 1, molders do nothing but operate their machines and shift molds to conveyors on which molds are advanced to pouring stations. Other men do all pouring from 400-lb trolley ladles filled from a mixing ladle that in turn is fed continuously from a cupola.

Nearly all small to medium size molds are produced on two squeezer lines one having ten and one having 14 squeezers. One line runs on an 18-min. and one on a 45-min. cooling cycle. Each line is served, of course, by its own conveyor loop and set of trains.

The roll-over line is for large molds which, because of their size, are slower to produce. These are operated in pairs one making a cope and one a drag produced with metal match plates and assembled on the conveyors. This line will have 12 roll-overs of which six are now in use. In this case, molds are asembled on gravity roller conveyors arranged along pouring aisles and remain on the conveyors to cool before being shifted by a power propelled car to the shakeout. Electric hoists and slings are used to shift the heavy molds to conveyors and from the car to the shakeout.

Conveyors serving squeezer lines are in the form of trains operated electrically and automatically. These trains pause for loading with molds next to squeezer lines and then proceed to pouring stations and thence, through cooling tunnels, to shakeouts at each of which mold boards are dumped by a single operator as the train pallets pass without stopping. Each shakeout is under a hood the exhaust from which carries fines to a Roto-Clone, for wet collection, and return to sand mixers.

Castings from shakeouts fall into a chute and

from it through a gate into monorail baskets advanced continuously by a chain. These baskets follow a long cooling circuit before they traverse a line where gates and sprues are broken off and castings are sorted into tote boxes on skids for removal by truck to the cleaning department.

Sand from the shakeouts falls down a chute onto a belt that delivers it via an elevator to a 300-ton storage bin. On the way, the sand passes a magnetic separator for removal of iron and is cooled to 95°F or below before being prepared again for molding purposes. To supply 300 tons of sand a day, only five to ten tons of new sand need be added and that chiefly for makeup of sand carried away on or in castings.

Much care is exercised in sand preparation which is done in National Engineering mixing equipment that includes a battery of three Simpson intensive mixers for mulling. Each of these units is fed from two 2500-lb hoppers for sand which is admitted through air-operated gates. Each muller operates on a 3-min. cycle which includes the addition of water, clay and Bentonite binders, the latter two being weighed out and the water metered.

Each muller has its own control panel and bell-light signals automatically timed. In mixing, allowance is made for the addition of fines that are recovered from the Roto-Clones as a slurry. When mulling is complete, the mixers are discharged onto a belt that feeds into an elevator and thence onto a high level belt which supplies the sand through hoppers to each squeezer and roll-over unit. Adjustable plows are set so that each hopper is kept filled at a rate proportioned to the molds being made.

Only Albany pure silica sand of 120 fineness number is used. The mix contains 3½ pct moisture and 9½ pct clay, including the Southern and Western and Bentonite binders and 1.80 pct max. carbon. Compression of 9 to 10 psi is used and 40 permeability is secured. Carbon is checked frequently because of its effect on permeability and the aim is to hold an average of 1.75 pct maximum. Maximum sand temperature at discharge from mullers is 95°F.

Discharge of sand at molding stations is by pedal-controlled gates directly into molds. Each molding machine is set on grating through which all excess sand sifts for return to mixers. Next to each shakeout there is also a grating. When molds contain fragile thin-section castings that might be broken in a shakeout, the mold is dumped onto this grating and castings receive special handling. Arrangements for sand-recovery are facilitated by having the molding done on a second floor below which sand transfer equipment is installed.

FIG. 5 - Pouring large molds on gravity conveyers. Molds are delivered to shakeout by the transfer cars visible at right center.

FIG. 6 - Dumping molds from a conveyer train into a shakeout unit. Note hood and exhaust piping for minimizing dust and steam.

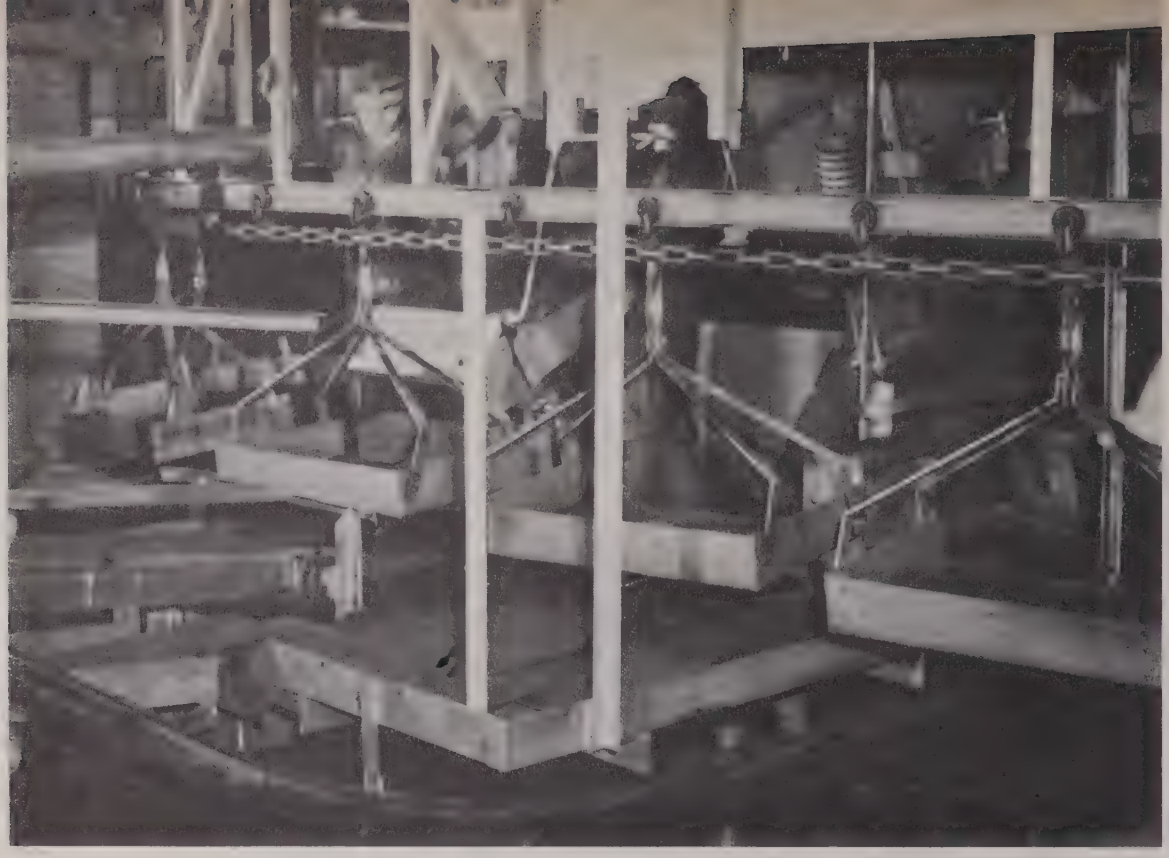


FIG. 7 - View of a shakeout unit from below. Castings fall into a chute and are discharged through a hand-operated gate into baskets hung from the chain conveyer. Sand is taken to storage bins, via conveyer belts.

All metal supplied for the three casting lines shown in fig. 2, is from a pair of cupolas provided for use alternately one day at a time. An average day's run is 125 tons. Charging facilities are not of the latest type but are to be converted as soon as new cupolas and supplementary equipment now on order can be installed. Nevertheless, all necessary steps are taken to maintain the highest grade, uniform quality of textile gray iron containing 10 pct min steel.

This iron is well suited for the thin sections that predominate in textile machine castings and commonly runs 30,000 to 40,000 psi in tensile strength and gives a modulus of about 15,000,000 psi. Where variations in hardness or in other properties are required, ferrochrome, ferrosilicon, copper or other innoculation is done at ladles.

Headings on the accompanying foundry control sheet, fig. 1, indicate how closely significant variables are checked in efforts to maintain uniformily in the iron produced.

Charging of the cupolas is done by a crane bucket of the bottom dumping type, each batch containing, of course, the proper weighed proportions of scrap, pig, coke and limestone. Slag is to be run off continuously into water and elevated into disposal cars as soon as alterations now in progress are completed and new equipment is received. The latter will include Whiting blast control and charging equipment.

Besides the new cupolas there is to be installed an electric furnace for reheating the residue from pouring ladles that now has to be pigged and later remelted. This furnace will also have capacity for iron that accumulates during lunch and rest periods beyond that which the mixing ladle can hold at the required temperature. At present this excess has to be pigged. Production of pigs, of course, reduces over-all melting economy besides requiring space, equipment and labor. With the electric furnace, these losses will be much reduced and the furnace will provide a moderate reservoir of molten metal that can be drawn off as casting needs may require.

At the end of the single eight-hour shift, the cupola is dumped and left to cool so that linings can be repaired the following day while the second cupola is in use.

Metal tapped from cupolas is run continuously into a mixing ladle on trunions and this ladle is tilted by a hand wheel to right or left as needed to fill the 400-lb pouring ladles. These are suspended from trolleys on a track that loops by the mixing ladle and are walked from this point to the pouring stations on the conveyor lines. Each line has its own set of ladles and the timing of the respective lines is such that pourings are staggered. In other words while one set of ladles is being filled, the set previously filled is in use at pouring stations and does not return for refilling until the other set has been filled and has been walked to its stations.

FIG. 8 - After castings have cooled in the conveyer baskets, gates and sprues are knocked off as shown here. Castings are also sorted on this line.

Pouring of large molds that come from roll-over machines and are set on roller conveyors is done from larger ladles than are needed on the train conveyor lines. These larger ladles are filled, however, from the same mixing ladle but at longer intervals because of their size and the slower production of large molds that these ladles fill.

At the end of the shift, empty ladles are walked to stations in a pre-heat room after any necessary repairs have been made. In this room, gas jets are provided for preheating so that when a new shift starts the following day ladles are hot and can be walked to the mixing ladle for filling in readiness for pouring as soon as molds are ready.

For most purposes, the gray iron normally produced has the properties needed for the average casting being run. For some special purposes, however, where higher physicals are required or where, for example, castings must have certain areas hardened subsequent to machining, innoculation is done in ladles.

Chills are sometimes applied in molds to yield hard surfaces in certain areas of castings but in other cases the hard areas are produced to better advantage by heat-treatment that is done after castings have been machined. In such instances, innoculation is employed to give the casting heat-treatable properties and heat treatment may be done by flame hardening. Several castings are also subjected to localized induction heating, quenching and tempering. Such procedures are now preferred to chilling in the mold partly because machining is facilitated and hard spots are more readily confined to the areas where hardness is wanted.

Before castings are delivered to the machine shop, they have to undergo cleaning and, in some cases, are heated in gas flames to permit straightening operations. At present most cleaning is done in two Wheelabrators, two Pangborn units and in a manually controlled sand blast cabinet. Certain castings are also pickled for scale removal. The present cleaning setup, however, is being augmented with the latest type Wheelabrator cabinet.

When alterations are completed, this foundry will be one of the most advanced and efficient for the production of gray iron castings to be found anywhere. Those portions now modernized have already contributed in a marked degree to the over-all economy attained and the quality of castings produced is maintained at a high level.

FIG. 9 - Sand mixer which handles a 3000-lb batch in 3 min. Sand moves by belt conveyer from the mixer to hoppers over the squeezer and rollover machines.

Gases in

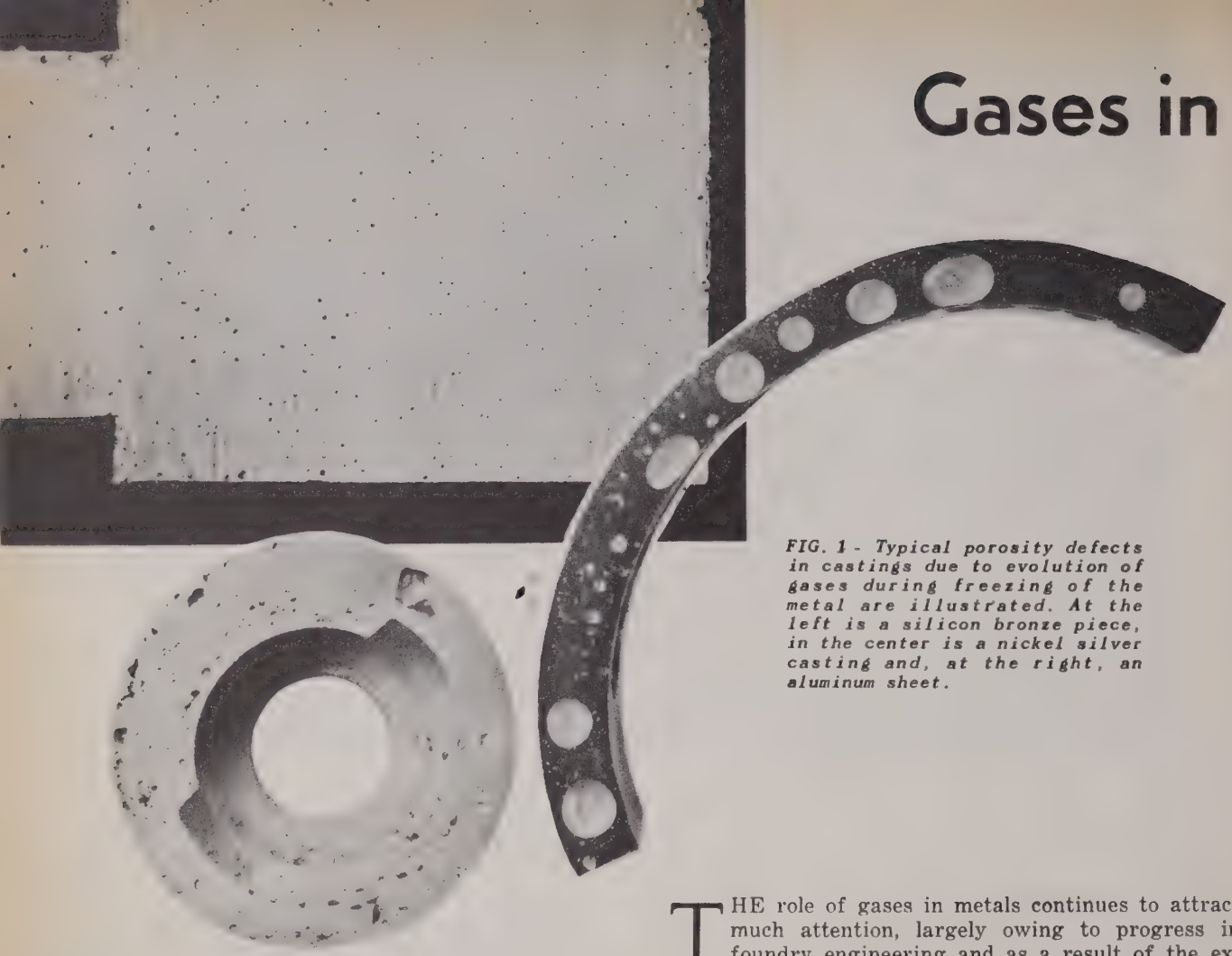


FIG. 1 - Typical porosity defects in castings due to evolution of gases during freezing of the metal are illustrated. At the left is a silicon bronze piece, in the center is a nickel silver casting and, at the right, an aluminum sheet.

THE role of gases in metals continues to attract much attention, largely owing to progress in foundry engineering and as a result of the expanded use of welding. The trend toward higher purity of metals is also directing attention to gases as impurities, and new industrial metals and applications, particularly in high temperature and vacuum service, pose new and interesting gas-metal problems.

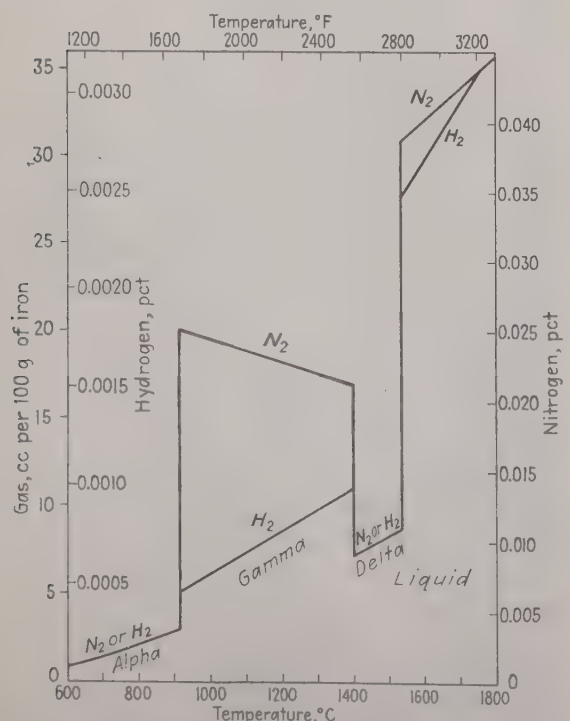
Gases affect metals in many ways. The common gases are often present in solid metals where they may exert a marked influence during processing or in service. Tough-pitch copper, for instance, contains a small amount of oxygen as cuprous oxide with the result that hydrogen embrittles the metal at elevated temperatures by the formation of water vapor. In steels, hydrogen can cause shatter-cracking and nitrogen may lead to strain-aging.

Gases dissolved in liquid metals play an important part in the solidification process. If gases are evolved during freezing, the release may cause unsoundness in the form of pinholes or blowholes, evident in the castings in fig. 1. Gases also may interfere with the feeding of interdendritic spaces and thus aggravate shrinkage porosity. On the other hand, the presence of gases in liquid metals is not always undesirable, because their controlled evolution can offset the shrinkage that accompanies solidification. This device is used in producing tough-pitch copper, rimming steel, and other applications where blowholes either do no harm or can be closed by subsequent working.

Gases affect the solidification process of metals in other ways. For instance, gases probably promote segregation, praticularly inverse segregation. Hydrogen seems to stabilize iron carbide during the soli-

BELOW

FIG. 2 - Solubilities of hydrogen and nitrogen, at one atmosphere pressure, in iron are shown as a function of temperature. From "Basic Open Hearth Steelmaking," AIME.



Cast Metals . . .

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Effects of gases in metal casting are many, and increasingly stringent quality specifications for castings reflect the theoretical progress and technical advances being made. This article comprehensively reviews the theory of gas-metal interaction and behavior from the standpoints of unsoundness in castings, sources of gases in standard casting operations. solubility of the common simple and compound gases in various metals and alloys, and the factors governing this solubility. Information on control of the reacting and absorbed gases and on nonequilibrium conditions and other aspects of gas-metal behavior is also given.

dification of cast iron, and it has been suggested, although without conclusive proof, that hydrogen induces columnar grain growth.

Gas unsoundness, by far the most important effect of gases in liquid metals, may occur in most of the metals used for castings. Some features of gas unsoundness are common to the copper base alloys[1], the light metals[2], cast steel[3] and also cast iron[4]. The laws governing the solubility of gases in metals are known and solubility data have been accumulated[5]. The distinction between simple and compound gases is essential for an understanding of the behavior of gases in metals. Simple gases are those composed of only one element, regardless of whether or not the gas occurs as a diatomic molecule, while a compound gas is represented by molecules made up of two or more elements. Compound gases can be split into their component elements to give simple gases and compound gases can be formed from simple gases, and these reactions are basic in the treatment of metals. For example, when carbon is smelted from iron, the process is simply the synthesis of compound gases, carbon monoxide and carbon dioxide, from a simple gas, oxygen, and carbon.

To consider the simple gases, a metal may be inert to a given gas or it may react with it in one of two ways, either dissolving the gas or forming a compound with it. At any temperature, there is a pressure below which a metal-gas compound will decompose. The decomposition pressures of some metal-gas compounds such as the stable oxides are low, while others, such as the nitrides of iron, have high decomposition pressures.

The rare gases are insoluble in liquid and solid metals, so pure helium and argon can be used as protective atmospheres and are well suited for flushing dissolved gases from molten metals.

Nitrogen is similarly insoluble in many metals. For example, copper and bronze can be exposed to it without risk of absorption. In iron and steel, nitrogen is soluble to a small extent at atmospheric pressure, as shown in fig. 2. Some other metals form nitrides even at low nitrogen pressures.

Most liquid metals will dissolve some oxygen. Molten silver, for example, absorbs oxygen from the air and evolves it during solidification. Many metals form oxides readily. For instance, in melting aluminum and its alloys, oxidation is troublesome as it can lead to harmful dross inclusions in castings.

Hydrogen is soluble in alloys of copper, the light metals and iron and steel as shown in the diagrams

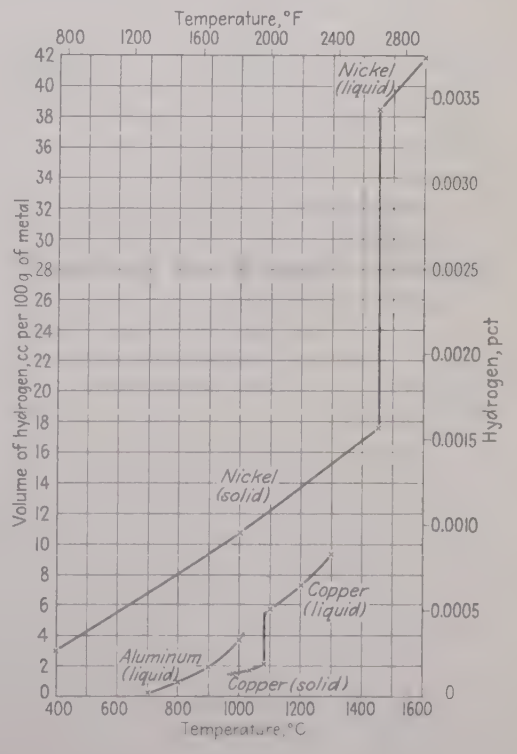

FIG. 3 - Solubility of hydrogen at one atmosphere pressure in aluminum, copper and nickel as a function of the metal temperature.

in figs. 2 and 3. The only common metals which do not dissolve it appreciably are metals having low melting points, such as lead or mercury. In nonferrous castings, hydrogen, alone or in combination with oxygen, should always be suspected as the most probable cause of gas unsoundness.

Experience with chlorine as a flushing gas indicates that its solubility in metals is negligible. Moreover, many chlorides vaporize at elevated temperatures so that if fluxes containing volatile chlorides are stirred into a melt bubbles are evolved which tend to degas the bath.

The amount of gas a metal can dissolve depends on temperature, pressure, the state of the metal, and, in alloys, also on the composition. The time of exposure, the area exposed, and other factors determine how nearly equilibrium or saturation is approached in a given case.

The solubility of simple gases in most liquid and solid metals increases as the temperature is raised, since metals dissolve gases not as molecules but as atoms. The dissociation of polyatomic gas molecules into their constituent atoms is a necessary step in the solution process, and because this dissociation requires energy, it is favored by high temperatures.

The increase of the solubility of gases in metals with temperature has an important practical consequence: The absorption of gases is kept down if the bath is superheated as little as possible. Plant experience and controlled tests agree that gas unsoundness in casting tends to be proportional to the degree of superheating.

The metals shown in figs. 2 and 3 dissolve more hydrogen in the liquid than in the solid state. This rule applies to all common metals and gases. Allotropic transformations also change gas solubility, as for example, gamma iron dissolves more hydrogen and nitrogen than do alpha or delta iron.

The decrease in gas solubility on cooling and solidification accounts for the occurrence of blowholes and gas porosity illustrated in fig. 1. Although most melts contain less than the saturation amount of gas, the residual liquid tends to become saturated as gas is rejected by the solidifying metal.

The reduction in gas solubility on freezing suggests a simple degassing method: Melting, solidification, and careful remelting to result in a bath of lowered gas content. This treatment, however, is costly in time and fuel and limited in effectiveness.

The amount of gas soluble in a metal increases with the pressure. According to Sievert's Law the solubility of a diatomic gas, such as hydrogen or nitrogen, is proportional to the square root of its partial pressure over the metal.

The importance of this square root relation may be illustrated by an example. About 30 g of molten iron dissolve 10 cc (S.T.P.) of hydrogen at one atmosphere of hydrogen pressure and 2804°F. If a mixture of gases at one atmosphere pressure contains only 1 pct of hydrogen the amount of hydrogen soluble will be proportional to the square root of 0.01 and will amount to 1 cc. A decrease in pressure of hydrogen by a factor of 100 thus reduces its solubility in iron by only a factor of ten. In this way even small partial pressures may be accompanied by appreciable solubilities.

A gas is insoluble in a metal if its pressure in the surrounding atmosphere is zero. This condition does not necessarily presuppose a vacuum, as the partial pressure of hydrogen in an atmosphere of pure argon is zero and hence bubbles of argon will remove hydrogen from a liquid metal. A metal therefore can be degassed by flushing with a stream of inert gas bubbles.[6]

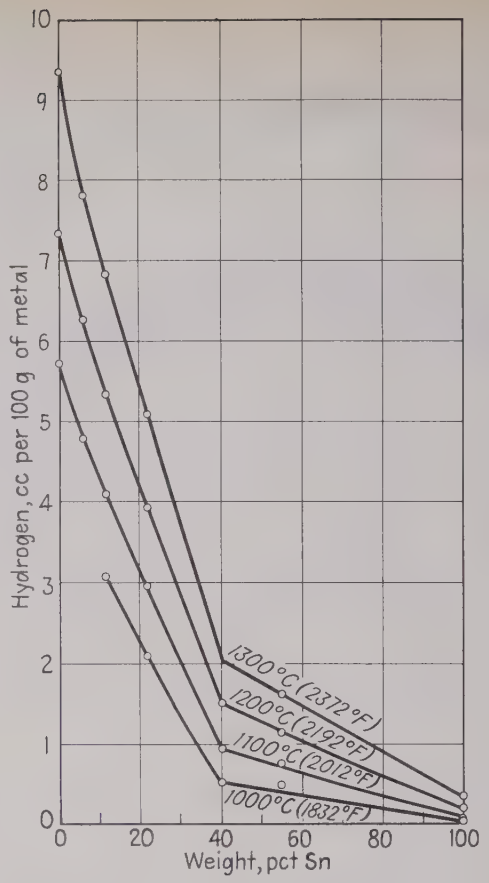

FIG. 4 - Solubility of hydrogen in molten copper-tin alloys at one atmosphere pressure as a function of the alloy composition. From paper by Bever and Floe, AIME.

In alloys the solubility of a gas depends also on composition. Fig. 4 shows the solubility of hydrogen in molten copper-tin alloys. Even appreciable amounts of tin dissolved in copper reduce the solubility of hydrogen only moderately. This small effect of alloying additions applies to the solubility of hydrogen in many alloys.

Nitrogen is also fairly insensitive to composition changes in many alloy systems. Carbon, however, reduces the solubility of nitrogen in liquid iron considerably, to the extent that at the carbon level of cast iron, the solubility of nitrogen is only about one-third the value for pure iron. This solubility is still smaller at the pouring temperature of cast iron, and these facts, together with the fairly large solubility of nitrogen in austenite, may well explain why nitrogen does not cause serious gas unsoundness in cast iron in spite of exposure to air in the cupola.

If two elements have a strong tendency to form a compound they also combine when they are in solution in a third element to form a compound which precipitates as a separate phase. Reactions of this kind make possible the deoxidation of steel and of many nonferrous metals. Elimination of dissolved nitrogen from steels by precipitation is also feasible and is done by adding zirconium or aluminum to precipitate the nitrogen in the form of nitrides.

When metals are exposed to air during melting or pouring, oxygen and nitrogen gain access to the melt and may go into solution, or form oxides and nitrides.

Gaseous elements enter metals also as solid compounds. For instance, nitrogen-bearing ferrochromium may introduce nitrogen into steel and nitrogen from this source will be equivalent to nitrogen absorbed from the atmosphere. Similarly, oxygen can be added to bronzes as the oxide of copper or of another metal.

The sources of hydrogen are less obvious and more varied than those of nitrogen and oxygen. If a reducing flame is used, the furnace atmosphere contains unburned hydrogen. Also alloy additions, especially of electrolytic metals, may introduce hydrogen into a melt, as occasionally occurs in ferrous castings.

The most important source of hydrogen is water vapor, which may be reduced into hydrogen and oxygen by the metal itself, by an alloying element, especially a deoxidizer, or by the electrodes of an arc furnace. Hydrogen formed in this way has an effective solution potential much in excess of that of molecular hydrogen gas at one atmosphere pressure and the saturation limit and absorption rate are correspondingly high. A similar instance of the special effectiveness of a nascent gas is the action of nitrogen derived from the dissociation of ammonia in the nitriding process.

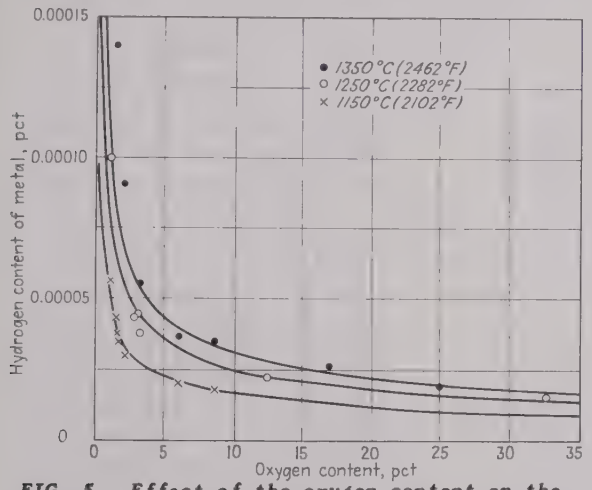

FIG. 5 - Effect of the oxygen content on the solubility of hydrogen, at one atmosphere pressure, in molten copper. From Journal of the Inst. of Metals.

Molten metals may come into contact with water vapor in many ways. The products of combustion of hydrogen-bearing fuels contain much water vapor so that open flame melting may lead to hydrogen absorption. Water vapor condensed on ingots and rusted scrap carries moisture into the charge, and it is for this reason that metals used for castings should be stored indoors or heated prior to charging. Fluxes absorb moisture from the atmosphere. Damp tools and refractories, such as insufficiently dried runners and ladles, are sources of moisture and thus of hydrogen.

Moisture in molds may cause porosity in castings by water vapor evolution or hydrogen absorption. In green sand molds the metal probably freezes too quickly for any extensive reaction to take place. Yet surface porosity due to damp green sand molds or condensed moisture on metal molds is not unknown.

To consider the compound gases, those of greatest interest from the stand-point of cast metals are water vapor and carbon monoxide. Carbon dioxide is of less importance. Sulfur dioxide plays a part in the solidification of tough-pitch copper, and hydrogen sulfide perhaps affects the solidification behavior of some metals, but this has not yet been proved experimentally.

Fig. 5 shows the equilibrium relations of hydrogen, oxygen, and molten copper[8] and fig. 6 gives data for the carbon-oxygen-iron system.[9] The increase in solubility with temperature and pressure illustrated in these figures is typical of the solubility of compound gases in metals, for the capacity of a metal to dissolve a compound gas decreases sharply on freezing. The solubility of compound gases thus parallels the behavior of simple gases with respect to the effect of temperature, pressure and solidification.

One must not assume that the constituents of a compound gas are found in a metal only in the single fixed ratio in which they occur in the gas. While the weight proportions of hydrogen to oxygen are 2 to 16 in water vapor, the ratio of the concentrations of hydrogen and oxygen dissolved in copper may have a different value. Only the absolute concentrations at equilibrium are fixed by the mass law. The constant relating these concentrations may be written in the following simplified form:

$$K = \frac{(pct\ \mathrm{H}\ in\ \mathrm{Cu})^2 \times (pct\ \mathrm{O}\ in\ \mathrm{Cu})}{Pressure\ \mathrm{H_2O}}$$

The numerator in this expression is the solubility product of hydrogen and oxygen in copper and is a function of the partial pressure of water vapor at the given temperature. Since hydrogen and oxygen may enter copper independently from different sources they are not likely to be present in the ratio in which they form the gas. However, their concentrations in the metal at equilibrium are limited by the solubility product at any given temperature and by the water vapor pressure.

Carbon and oxygen may cause gas unsoundness in copper and its alloys by evolving as carbon monoxide under certain conditions; but hydrogen and water vapor are the common causes of porosity in these and other nonferrous metals. Hydrogen and water vapor porosity are now well understood, and in many copper alloys gas porosity can be prevented by an oxidation treatment[10] in which the addition of oxidizing fluxes results in a relatively high oxygen concentration in the bath and a corresponding decrease in hydrogen content in accordance with equilibrium relations of the type shown in fig. 5. Subsequent deoxidation completes the treatment. The traditional practice of melting copper base alloys with an oxidizing flame is equivalent to oxidation with special fluxes, but does not permit the same degree of control.

Carbon monoxide dissolves in iron in a manner similar to the solution of water vapor in copper.

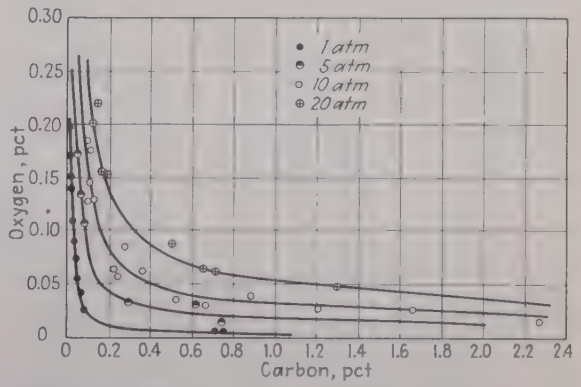

FIG. 6 - Data on the effect of carbon on the oxygen content of molten iron at 2804°F at various pressures. From Transactions, ASM.

Molten low-carbon steel may contain as much as 0.01 pct of oxygen without being supersaturated with carbon monoxide at 1 atmosphere pressure, as shown in the relation of carbon and oxygen percentages in fig. 6. At the same temperature, cast iron is saturated at about 0.001 pct of oxygen. In both examples it is assumed that no stronger deoxidizers than carbon are present.

In the production of steel for ingots or castings, carbon is eliminated by oxidation, and the resulting evolution of carbon monoxide has a purging action on dissolved hydrogen and nitrogen.[11] If the carbon boil is not active enough or sufficiently prolonged, the steel produced may have a high content of these gases and so may be given a flushing treatment with an inert gas. In rimming steels the concentrations of carbon and oxygen are so adjusted that carbon monoxide is evolved in the mold at a suitable rate.[12] Quantitative data for the carbon-oxygen reaction as well as for many other equilibria involving iron as a solvent are now available.[13]

This discussion has been primarily concerned with the equilibrium aspects of the solution of gases in metals. Equilibrium, however, only sets the upper limit for gas absorption and the lower limit for gas evolution; the rates of these processes determine the extent to which equilibrium is actually approached in any given case.

In quiet baths gases dissolve by diffusion, and although diffusion is fairly rapid in liquid metals, gas absorption can be reduced by shortening the time of exposure. Flux covers and slags are effective means of avoiding or minimizing gas-metal contact. Stirring, on the other hand, accelerates gas absorption.

The mechanism and kinetics of the separation of gases from metals are more complex than those of gas absorption. Gas evolution occurs if the concentration of a simple gas or the solubility product of the constituents of a compound gas exceeds a certain value. This value at any temperature depends on the gas pressure above the melt, as shown by the equilibrium constant.

One way in which a gas can leave a metal is by gradual outward diffusion which is comparable to the slow evaporation of a liquid below its boiling point. More rapid gas removal requires a separation of gas throughout the volume of the metal analogous to the formation of bubbles in boiling, and this can only occur if the pressure of the precipitating gas exceeds a certain value at the point of bubble formation. This value must be larger than the sum of the total pressure above the bath and the hydrostatic head of the metal because the gas must develop enough additional pressure to overcome the surface tension of the liquid metal. Rough surfaces and nuclei such as finely divided solids help to reduce the effect of surface tension.

It has been suggested[14] that the pinholes sometimes found immediately below the surface of cast steel are initiated by the precipitation of water vapor to form nucleus bubbles which then grow by the subsequent diffusion of hydrogen out of the steel. The degassing action of the boil in steelmaking and the flushing of melts by means of inert gases are other examples of the nucleation of gas precipitation by the bubbles of a second gas. Large bubbles result in this way and may acquire sufficient mechanical mementum in rising to permit them to break through a slag or flux cover.

This review of gases in cast metals shows that the fundamental laws of gas metal behavior are well known, and in particular that the causes and prevention of gas unsoundness are understood. It is the task of applying this knowledge in industrial practice that is still a challenge to the skill of the operating metallurgists responsible for the quality of cast metals.

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Thermal Balance Problems in German Steelmaking

A MATTER of great concern to the steelmaking industry in Germany is the manner in which the overall heat and fuel balance of a mixed blast furnace and steelworks is affected when the load factor of the entire installation is materially reduced. While the problem is more pressing in Germany than elsewhere, due to the acute coal shortage and resulting restricted iron and steelmaking operations, it is one that is held to be potentially more universal in the future what with reserves of high-grade ores and good coking coal becoming gradually depleted.

In an article by H. Schumacher, appearing in *Stahl und Eisen*, Nov. 6, 1947, it is demonstrated how the heat per ton of ingots on the steelmaking side increases with decreasing output, and also how on the ironmaking side the coke consumption per ton of pig iron will increase with decreasing output. The two factors, however, do not balance each other, because when the blast furnace is driven at a reduced rate, a greater percentage of the available heat from the blast furnace gas has to be used for blowing and heating the blast.

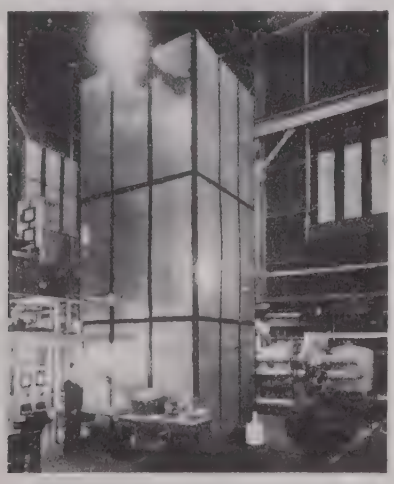
Thus, as the output of the balanced iron and steelworks is progressively reduced, not only does the overall thermal efficiency fall, but there comes a point at which the installation is no longer thermally balanced, and the heat available from the gases is no longer sufficient to supply the steelmaking furnaces and rolling mills with as much as they require. If the works is to maintain in production, this shortage must be made up from outside.

New Equipment . . .

An oxygen plant, a blast cleaning machine combining tumbling and longitudinal travel of the work, a hot-chamber diecasting machine, a small melting furnace for nonferrous castings, and various foundry equipment are featured this week. Also described are a gear shaper, a shape-welding machine, heat-treating furnaces, a strain amplifier, contour projector, a motorized crusher, and a plating bath agent.

Oxygen Plant

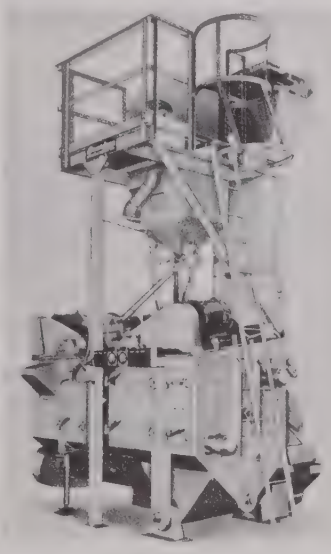
DEVELOPMENT of a new process for the manufacture of relatively pure gaseous oxygen in tonnage quantities is announced by *Elliot Co.*, Jeannette, Pa. A pilot plant, which has been operating for more than two months, has proven that the process can operate indefinitely without necessity of periodic defrosting shutdowns, thus overcoming one of the disadvantages of similar plants which are unable to



stay on stream continuously. In the process of making oxygen, preconditioned air is cooled to below — 300°F, and distilled in a special distillation column into its components, oxygen and nitrogen. The oxygen is then piped to the process where it will be used. The nitrogen from the Elliot process is said to be so pure that it can be used as a chemical raw material or for bright annealing in steel mills.

Blast Cleaning Machine

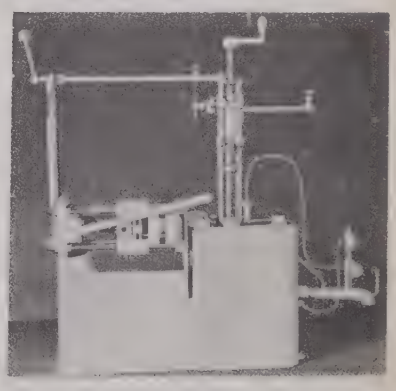
FOR high production blast cleaning, *American Wheelabrator & Equipment Corp.*, Mishawaka, Ind., has developed the Continuous Wheelabrator Tumblast which utilizes a combination of tumbling and longitudinal travel of the work. Parts are fed into and discharged from the machine in a continuous flow. Work to be cleaned is carried through the blast barrel on an endless apron type



conveyer which constantly tumbles and cascades the pieces, thereby exposing all surfaces to the full effect of the abrasive blast from the overhead unit. The rate at which the work progresses through the cleaning chamber is regulated by tilting the mill to the proper angle by means of jack screws. Since the speed of tumbling and the flow rate of work through the mill can be adjusted, the speed of production and the quality of cleaning can be controlled.

Semi-Air Diecasting Machine

A SMALL semi-air diecasting machine, known as Model AHH-1, has been announced by *H. L. Harvill Mfg. Co.*, 2404 W. 7th St., Los Angeles 5. The machine is a small production model with injection of the metal accomplished by air pressure through an immersed injection piston assembly, popularly known as the hot chamber method. The machine casts zinc, lead and tin base alloys through a center gate. Dies are opened and closed by hand, with ejection of the castings after solidification accomplished by the same manual method. Safety interlock features make it impossible to inject the molten metal into the die cavities unless and until the dies are locked in their closed position. The equipment is capable of operating at a speed of 500 cycles per hr. Normal die dimensions, vertical by horizontal, are 6x10 in.; dimension between dies, open, 5 in.;



maximum die thickness with dies closed, 6 in. The machine is equipped with a gas burner unit requiring 330,000 Btu per hr max. An oil burning unit may also be obtained. A volume of 8 cu ft of air per min is required to operate the machine at its maximum rate. Metal injection capacity for zinc alloy is 14 oz.

Core Binder

DEVELOPMENT of a phenolic resin to bind sand cores used in the casting of metals has been announced by the Chemical Dept., *General Electric Co.*, Pittsfield, Mass. The material is uniform, flexible, and non-sticky, has good flow-

ability and low moisture content. It is said the core binder imparts enough dry strength to the core materials to allow the core to be handled while still warm. With a minimum of baking time and temperature it imparts sufficient strength to the core to withstand pouring temperatures of 2750°F. Designed to have a low hot strength and excellent green strength, the binder evolves very little gas during pouring and will not impair the properties of the core material after shake-out, the company reports. It is available in concentrated form.

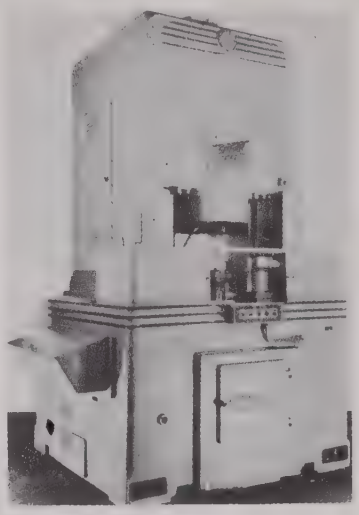
Plastics Molding Machine

DEVELOPMENT of a large capacity thermoplastic injection molding machine, capable of molding 40 oz of acetate or 32 oz of polystyrene per cycle has been announced by *Hydraulic Press Mfg. Co.*, Mount Gilead, Ohio. This giant

machine was designed specifically to broaden the scope of plastics mass production to include such items as refrigerator parts, large radio cabinets, and similar large area parts. It molds all types of thermoplastic material and is entirely automatic. Four operations exist between the raw plastics material and the finished molded part: Mold is closed and tightly clamped; molding material, placed in the hopper of the machine, is fed in measured quantity into a two zone electrically heated chamber where it is plasticized; a hydraulically actuated plunger injects the plastic material into the closed mold; after a predetermined chilling period, the mold opens automatically and ejects the molded part. The machine weighs 82,000 lb and is 264 in. long x 60 in. wide.

External Shaper

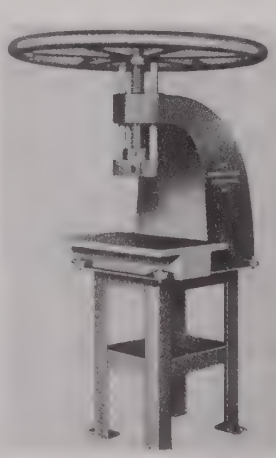
CAPABLE of cutting gears, toothed clutches and other external shapes up to 10 in. OD and 2¾-in. thickness, a larger Shear-Speed external shaper, Model 18103, has been added to the line manufactured by *Michigan Tool Co.*, 7171 E. McNichols Rd., Detroit 12. Powered by a 30-hp electric motor, the machine will handle work from 7 to 10 in. OD, or with special liners it will



take work as small as 5 in. OD. Maximum stroke on the machine is 3 in. Cutting all teeth in a gear simultaneously, the shaper is recommended for gears or involute splines from 5 to 12 pitch. Straight sided splines, sliding clutches, ratchets, inverted splines and other external shapes can be cut with this model, either individually or stacked and cut in multiple units where this is feasible. A new feature of the 18103 is the method of automatically locking the head in cutting position.

Die Tryout Press

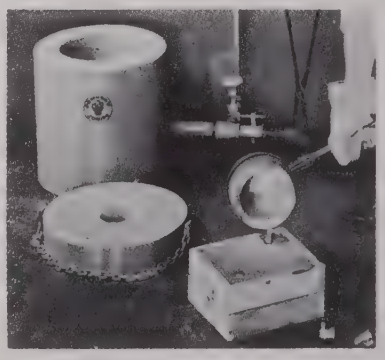
FOR testing dies without using a production press, *General Mfg. Co.*, 6430 Farnsworth Ave., Detroit



11, has developed the diemaker's tryout press, which can be installed in the die shop either on a bench or on its own fabricated stand. A heavy, large diameter hand wheel, in combination with the high lead thread on the ram, enables the diemaker to safely move the punch in and out of the die at the rate of 1.6 in. per revolution. By whirling the wheel, 60,000-lb percussion pressure is available for test pieces after the die is completed.

Small Melting Furnace

FOUNDRY JUNIOR, a small melting furnace complete with equipment and tools to produce sand and plaster mold nonferrous castings has been announced by *Sawyer Bailey Corp.*, 785 Hertel Ave., Buffalo. The complete unit consists of furnace, crucibles, tongs, crucible holder, skimming and stirring rods, asbestos gloves and goggles. The molding equipment consists of a special grade foundry sand, flask,



riddle, rammer and all other necessary tools. The furnace shell is of welded steel construction, lined with high grade refractory and capable of operating at a temperature of 2400°F. The cover is of the same refractory, reinforced with steel bars. Manufactured, natural gas or bottle gasses may be used as fuel. The furnace will hold crucibles having a working capacity of 10 lb of aluminum or 34 lb of brass or bronze.

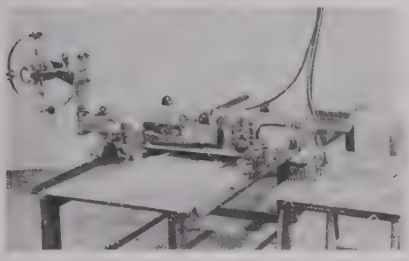
Die Lubricant

DIE Slick No. 4 manufactured by *G. W. Smith & Sons, Inc.*, 5400 Kemp Rd., Dayton 3, is a lubricating compound developed principally for lubricating the piston, ram or plunger, on cold-chamber diecasting machines. It is also recommended for ejector and guide pins on pressure diecasting dies and for use on all movable parts of permanent molds. The lubricant is

applied with brush or swab and may also be sprayed. It contains no fats or heavy carbonizing materials, causes no gumming, will not become rancid, and withstands extremely high heat, it is reported.

Shape-Welding Machine

BY using a strip template, welds to any outline can be made by the submerged-melt process on a new machine announced by *Linde Air Products Co.*, unit of Union Carbide & Carbon Corp., 30 E. 42nd



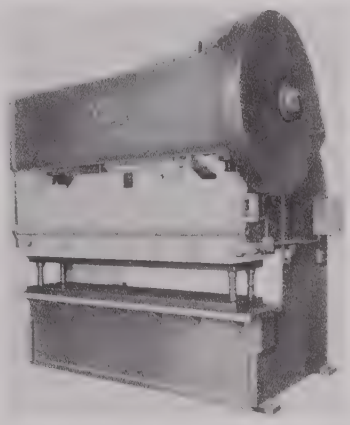
St., New York 17. The WM-6 machine, a carriage of the type that has proved most useful in oxyacetylene shape cutting, is used to carry and guide a Unionmelt welding head. The type U welding head has a maximum current capacity of 2000 amp and can weld in a single pass material from 18-gage to 1¼-in. plate. Heavier parts of almost any thickness can be welded by a suitable number of passes. The machine will operate over an area 34 in. wide x 80 in. long. The welding speed is adjusted by a stepless speed control on the tracing machine. Standard or high speed tracing heads make it possible to weld at speeds from 4 to 40, or 11 to 100 ipm.

Gas Fired Furnaces

GAS fired furnaces for annealing, carburizing, drawing, hardening, spheroidizing, malleablizing, normalizing, and dry cyaniding are now available from *Westinghouse Electric Corp.*, Pittsburgh 30. These will supplement the regular line of Westinghouse electrically heated industrial furnaces and will be designed for use with separately prepared protective atmospheres such as Exogas, Endogas, Monogas or Ammogas. Among some of the gas fired furnaces available are: cylindrical bell types used for bright annealing of copper wire in coils and in reels, of steel wire or strip, and other applications such as spheroidizing or drawing; continuous pusher types for annealing, gas carburizing, hardening, and malleablizing; continuous roller hearth furnaces for applications such as cycle annealing, hardening, malleablizing, and drawing; continuous conveyer furnaces for heat treating applications where light and medium weight parts are involved.

Gang Press

TO bridge the gap between press brakes and large, heavy blanking presses, *Verson Allsteel Press Co.*, 1355 E. 93rd St., Chicago 19, has developed a line of gang presses ranging in tonnage capacities from 100 to 350 tons in bed lengths from 72 in. up. These presses are especially designed for blanking, forming, punching, shallow drawing, and mul-



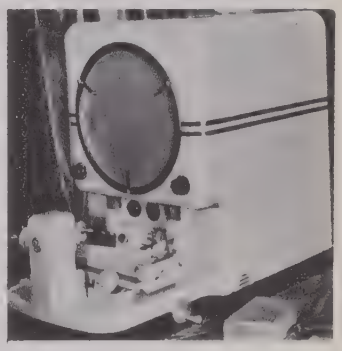
tiple operations whereby a series of operations may be done in one handling. Control is by means of electrical push buttons, hand or foot operated, and a selector panel for inching, one stroke, or continuous operation.

Heat-Treating Furnace

AN ELECTRIC heat - treating and preheat furnace with a range of from 400° to 1850°F which is recommended for general purpose heat treating and preheating high-speed steel, has been announced by *Sunbeam-Stewart Furnace Div.*, Ogden Ave., Chicago 23. Heating elements are provided on four sides of the chamber for close temperature control and even heat distribution. Rolled nickel-chrome-alloy ribbon is formed into continuous loops supported with insulators allowing free expansion and contraction, and radiation of heat. Door is operated by foot-operated air hoist or manually. The unit is available in sizes ranging from 6x12x18 in. to 18x36x60 in. heating space.

Contour Projector

DESIGNED by *Eastman Kodak Co.*, Rochester, N. Y., for use in its own manufacturing operations, a new contour projector embodying a number of new optical principles answers the need for rapid and accurate inspection of precision parts. The magnified image of a part is compared with a master tolerance chart or drawing. An opti-



cal system unique to contour projection provides a constant working distance of 8 in. between the part and the first lens of the projection system. This distance is maintained at all magnifications and affords ample space in which to mount efficient staging fixtures which are interchangeable at different magnifications. Once a part in the fixture is brought into focus at one magnification, no further focusing is required as other magnifications are used. Any selected magnification is maintained at all times independent of the focusing operation. Optical distortion is held below measurable limits over the entire magnified area, so that desired dimensions can be compared directly on the master chart on the screen. For measuring surface features or sections of an object where the profile is obstructed, such as punches, cavities or engravings, two powerful auxiliary illuminators behind heat-absorbing windows provide a bright image in natural color on the screen instead of a shadow image. Both a surface image and a profile image can be projected at the same time.

Strain Amplifier

A STRAIN amplifier, model B1-310, designed for use with Brush direct-inking oscillograph

has been announced by *Brush Development Co.*, 3405 Perkins Ave., Cleveland 14. With this instrument, immediate chart records of strains can be made with the Baldwin SR-4 strain gages. It is equally well adapted for use with the various Statham laboratory pickups or many types of resistance sensitive gages. The equipment records either static or dynamic strains up to 100

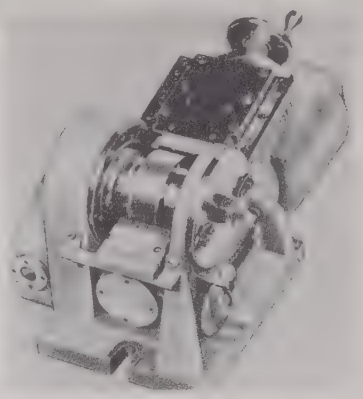
cps, and direction as well as magnitude of the measured strain can be read from the chart.

Die Loading Truck

A 4000-LB capacity truck known as the Worksaver which is designed for handling heavy dies and molds is now available from *Yale & Towne Mfg. Co.*, 4530 Tacony St., Philadelphia 24. This electric "walkie" is said to pick up the die or mold at the storage zone, transport it to the press, lift it level with the lower platen of the press, and mechanically load it into position. Loading arrangement permits the operator to mechanically load and unload dies or molds. High load feature is said to make possible transportation of molds and dies from storage racks of different heights and to load and unload presses of different types. The truck is also recommended for handling heavy machinery and large parts. Features are listed as a three-section roller platform, a ratchet-actuated, cable and sheaf self-loading arrangement, and a high-lift mechanism.

Motorized Crusher

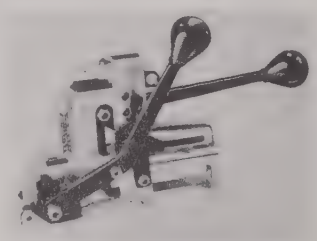
A SELF - TRUING motorized crushing device for forming cast iron crushtrue rolls and crushtruing grinding wheels has been announced by *Sheffield Corp.*, Dayton 1. This device is a selfcontained, two-speed unit employing a carbide tool for dressing the form of a Meehanite or other close grained cast iron roll, which is then used to crush the grinding wheel without removing the roll. It is designed for mounting on the table of an 8x24-in. or larger wet type surface grinder. The



roll is rough-formed on a lathe and finished formed in the crushing device. When the roll becomes worn the operator shifts the clutch to low speed and feeds the carbide tool into the roll to restore its form. All elements of the form are said to be held precisely in grinding thread-rolling dies, laminated sections, punch and die sections and flat or cylindrical work of irregular contour.

Strapping Machine

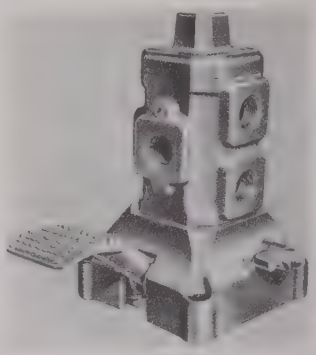
TO MEET requirements of shippers who strap shipments for maximum protection on a production basis, *Signode Steel Strapping Co.*, 2600 N. Western Ave., Chicago 47, has developed a one-tool strapping machine that tensions, cuts and seals with minimum motions and



less effort. Known as the A-2 seal-feed strapping machine, it is said to be efficient for bundling operations, as well as in strapping boxes, crates and cartons, in a wide range of sizes and weights. Maintenance and repair are negligible. The tool seals feed automatically from a magazine; reloading units are inserted quickly.

Hydraulic Control Valve

LATCHING or free control of double-acting hydraulic cylinders is provided on a foot-operated, 4-way hydraulic valve recently introduced by the *Logansport Machine Co., Inc.*, Logansport, Ind. The model, designated as a balanced pressure valve of the sliding piston type, is designed without valve seats or packings other than the stem seals at each end which are subject to only



exhaust pressures. Base area of sizes ranges from 5⅜ to 7⅛ sq. in. The valve is available in standard port sizes from ¼ to 1 in. and is designed for oil hydraulic service at pressures to 1500 psi. Special valves for operating pressures to 2500 psi in oil hydraulic circuits and to 1500 psi in water hydraulic service may be obtained.

Plating Bath Agent

UP TO 95 pct. of the chrome fog or mist is claimed to be eliminated in chromium plating baths, with the use of No-Cro-Mist, a solution developed by *R. O. Hull & Co. Inc.*, 1279 W. 3rd St., Cleveland 13, to control the evolution of fine fog or mist by chemical means. The product which is added in amounts of ½ to 1 gal. per 500 gal. of solution, is a soluble liquid that changes the physical form of the usual spray so that it does not escape readily, and also forms a slight blanket around the anodes. Operation of the bath is said not to be affected by the addition agent, and reracking for chrome after nickel is usually avoided.

Safety Goggle

SAFE-T-VIS, a new type of safety goggle is being marketed by the *Univis Lens Co.*, Dayton. This product is made of an allyl casting resin, incorporates the lightness, comfort and added safety features of plastic but resists surface scratchings. It is said that one Safe-T-Vis lens is approximately one-half the weight of a case-hardened glass lens.

Lock made by the Norwalk Lock Co., South Norwalk, Conn., showing Revere extruded brass rod from which the handle is made.

T IS significant that in the highly-competitive building hardware trade Revere Metals are extensively used to roduce fine items. Take this Norwalk Lock and latch ssembly. The escutcheon plate is stamped from sheet rass, Revere Alloy No. 160, known as Cartridge Brass, 0%. This has superior ductility, and takes a high polish.

The handle is made from extruded leaded brass rod, evere Alloy No. 280, which is widely used for hardware, rgings, and plumbing goods. This is supplied in straight ill lengths, and the manufacturer cuts it to length, bends, achines and drills each end, and threads inside and out. fter polishing he has, at low fabrication cost, a handle at is strong, solid, and whose beauty will endure through e years.

In manufacture of the tumbler lock, free-cutting brass od, Revere Alloy No. 240, is used because of the ease and peed and accuracy with which it may be worked.

The Norwalk Lock Company states: "At this time we ight place ourselves on record as recommending, wher-ver possible, the use of brass and bronze on our products to the hardware trade in preference to other cheaper metals."

The wide range of the Revere Metals makes it possible for you to select exactly the correct ones. Revere supplies its metals in mill products as follows: *Copper and Copper Alloys:* Sheet and Plate, Roll and Strip, Rod and Bar, Tube and Pipe, Extruded Shapes, Forgings—*Aluminum Alloys:* Tube, Extruded Shapes, Forgings—*Magnesium Alloys:* Extruded Shapes, Forgings. Revere's Technical Advisory Service will gladly collaborate with you in studying these metals in their various forms, and their suitability for your product and processes.

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Assembly Line . . .

WALTER G. PATTON

• Ford's first postwar cars are introduced to the public . . . All-new Mercury and Lincoln models are shown to Detroit's press section.

DETROIT — Introduction of the new postwar 1949 Mercury and Lincoln models this week left little doubt that Ford will be in the thick of the hot competition in the medium and high priced fields of the auto industry in the months ahead. The new Ford will remain under wraps for seevral more months.

The new Lincoln's were displayed in dealer showrooms on Apr. 22; the Mercury will make its bow to the public one week later on Apr. 29.

Members of the press who were given an opportunity to drive the new cars this week were in for some pleasant surprises, despite the fact that many of the styling and engineering details had been pretty well sifted by the rumor peddlers who are always doing a lively business in the motor capital.

Styling of the new cars is conservative—but highly pleasing. The rear fender has been absorbed into the body as predicted. Bumpers are the wrap-around type. The cars are appreciably wider and lower. Visibility has been improved substantially by the use of larger window openings and curved windshields. In the case of the Lincoln Cosmopolitan model the windshield is one-piece; the Lincoln and Mercury have divided windshields.

What most of the press was interested in was the way the cars ride and handle on the road. Another point that is sometimes criticized in the present Mercury and Lincoln models is the amount of steering effort required and the present system of spring suspension.

Whirling around the test track at Dearborn at 70 to 80 mph, the new models demonstrated in the opinion of this observer unusual road stability and ease of handling. The new steering system devised by Ford engineers, while following closely front and coil suspension used by other car makers, includes several refinements that give the new models unusual resistance to road wander, particularly in high winds. The cars handle with ease at high speeds.

As in the past, the Ford engines have exceptional power and the cars are reported to be capable of accelerating from a standstill to 60 mph in second gear in 15 sec.

Automatic overdrive that is reported to give up to three more miles per gallon, is available on both the Mercury and Lincoln; it is optional equipment on the Mercury and Lincoln and standard equipment on the Lincoln Cosmopolitan. With the overdrive, the driver can shift quickly into third for passing other cars on the highway.

In the table below a comparison of wheelbase, weight, height, powerplant and other pertinent details is shown for those who are interested in making direct comparison of the three new cars. As indicated in the table the new Lincoln models have an entire different body and powerplant from the Mercury.

The Lincoln Cosmopolitan has a wheelbase of 125 in. and the Lincoln wheelbase is 121 in. Both are powered by a new 152 hp 8-cylinder engine which is, incidentally, the largest V-8 engine Ford has ever built.

REAR fenders are integral with the body. By building the bodies to nearly the full fender width, several inches additional seating space has been obtained without increasing the overall dimensions of the car.

A one-piece curved glass windshield is used on the Cosmopolitan while a two-pane V-type is employed on the Lincoln and the Mercury. Both Lincoln windshields are nearly 6 in. wider than the flat windshields used on the previous model.

In both Lincoln models, improved riding qualities have been achieved in part by the use of the Hotchkiss drive instead of a torque tube drive. Other factors contributing to the improved stability and easier riding qualities of the car are the new coil suspension and a new transverse mounting arrangement of the shock absorbers. Front wheel coil springs are insulated with rubber and are mounted in wish-bone shaped pressed steel arms. Telescopic shock absorbers are mounted inside the coils. A simplified front roll stabilizer connects directly to the spindle support.

Brakes are duo-servo self-energizing type featuring a high ratio of brake lining area per pound of car weight.

A semi-floating rear axle replaces

Specifications for New 1949 Lincoln-Mercury Models

	Mercury	Lincoln	Lincoln Cosmopolitan
Wheelbase, in.	118	121	125
Curb weight, lb	3600	4100	4600
Overall length, in.	206.7	212.5	220
Overall width, in.	76.96	76.5	78.6
Height loaded, in.	62.95	63.5	62.6
Engine Displacement, cu. in.	255	337	337
Compression Ratio	.....	7.0:1	7.0:1
Horsepower, max.	110	152	152
Torque, ft-lb max.	.....	265	265
Front Seat Width, in.	57.1	57.1	59.5
Rear Seat Width, in.	60.7	60.7	58.8
Windshield Width, in.	.....	52.6	57.0
Trunk Volume, cu ft	.....	25	22

You'd never think twins could be so different

Look closely. Can you tell these milling cutters apart? Both fit the same arbor. Both were designed to do the same milling job. Both cost about the same, *initially*.

Yet, like a set of human twins, tools that *look* alike can be told apart in several ways.

One way is by their "behavior" during comparison tests, when they're run alternately on the same machine, by the same operator, cutting the same stock. You'll know the Pratt & Whitney cutting tool by its *cleaner cutting action* . . . its *longer* life . . . its *trouble-free* performance that reduces spoilage . . . its low cost per piece.

Another, simpler way to recognize the better cutting tool is to look for its "birthmark", the little *P&W* we proudly stamp on every small tool we make — tap, die, reamer, cutter, end mill, counterbore, cut-off tool, thread rolling die, and many others.

No matter how small the tool, its accuracy and durability is always our first consideration. The P&W trademark on a cutting tool guarantees it to be the finest that American craftsmen know how to make. We can prove it by actual performance data.

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Division Niles-Bement-Pond Co.
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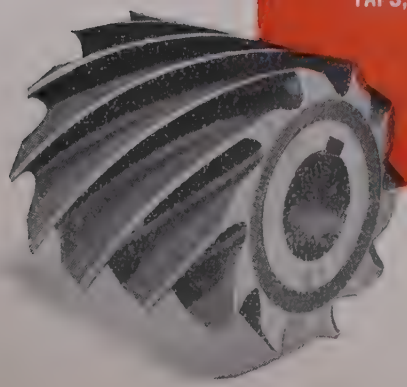
Pratt & Whitney Small Tools

TAPS, DIES, REAMERS, CUTTERS, END MILLS, COUNTERBORES,
CUT-OFF TOOLS, THREAD ROLLING DIES . . .



"There is no better-paying investment than the right tools for the job"

the three-quarter floating axle in the earlier models. An innovation is Ford's system of bolting the rear wheels directly to the flanged axle shaft ends. This eliminates the hubs and is said to simplify the removal of rear tires which now drop down and don't have to be pulled over the hubs.

All Lincoln models have synchronized transmission and Lincoln officials expect that a minimum of 75 pct of Lincoln buyers will select the automatic overdrive with 0.72 to 1 ratio that will be available at extra cost, factory installed. No announcement has been made as to the introduction date of a Ford automatic transmission.

The new Lincoln K-type welded and riveted frame consists of deep channel side members with four cross braces and a heavy channel X member. Special reinforcement is used on all convertible models.

ACCORDING to Ford engineers the V-8 motor, being shorter and more compact than an in-line engine, offers advantages as to increased passenger room, shorter hoods and improved visibility. A forged crankshaft with integral counterweights is used. Bearings are triple-layer copper-lead alloy with steel backings.

The engine is equipped with a dual-concentric, downdraft carburetor and an air-cooled fuel chamber. Separate exhaust systems are provided for each bank of cylinders.

Improved engine cooling is claimed for the latest Ford design which routes the water the full length of the block from front to rear, returning through the heads to the radiator.

Zero-lash valve lifters are specified and one-piece valve guides are pressed into the block.

Engine vibration is said to be reduced by a new, permanently-sealed vibration damper operating in silicone fluid. The possibility of piston slap has been reduced by embedding steel struts in the aluminum pistons.

The dash panel has been moved forward 4 in. in the new Lincoln models. Front seat movement as well as window operation is hydraulically controlled and push-button operated on all Lincoln Cosmopolitan and convertibles.

The powerplant for the new Mercury is 110 hp V-8 which will be used in this model only. As a result of styling changes, the front seat of the new model is nearly 8 in. wider than the preceding model. The rear seat has been widened nearly 3 in.

Frame and power plant improvements, in general, follow the engineering changes introduced in the new Lincolns. As in the case of the Lincoln models, employment of the Hotchkiss drive has reduced the size of the "tunnel" in the rear compartment. Unsprung weight has been reduced by the use of the new individual coil suspension.

Outside door handles pull rather than turn. Instruments are well grouped in front of the driver. The car has a door-locking system which permits either front door to be opened with a key.

LARGER water pumps for each bank of cylinders have been provided in the new models. A reduction of 12° in cylinder head "hot spots" has been achieved in the new system, according to Ford engineers.

Intake manifold branches have been redesigned to provide better fuel distribution. New engine mounts of bonded rubber and steel provide improved insulation, quieter operation and are said to eliminate any tendency to clutch chatter.

Mercury engineers claim the possibility of vapor lock under severe heat conditions has been overcome by a new feature known as a right-angle type, concentric, isolated carburetor float bowl. The float bowl is said to be "isolated" since it is suspended in the air stream between the air cleaner and carburetor and is cooled by the rush of air.

A special vacuum booster pump is provided to give improved windshield wiper operation. Better steering geometry is claimed to result from the new individual front wheel suspension. Separate adjustments for both caster and camber are provided.

The new Mercury body hangs from the chassis on tension shackles instead of riding on it through the medium of compression shackles. This feature, combined with the new spring mounting geometry and transversely mounted shock absorbers, has eliminated the track bar, a device usually employed to maintain rear end stability.

Low pressure super balloon tires are used on all Mercury models. Passenger models use 7.10 x 15 four-ply tires.

The new Mercury station wago employs steel construction for a except the wooden body panels—a all-steel shell with wood panelling The top is steeel. Two extra wid doors have been provided instead o the usual four-door construction.

Other features on the new car include an automatic spark ad vance, a new electrical system, long er life wiring system, larger capac ity high voltage coil and a nev heating system that doubles the ai output through the windshield de froster.

British-Built Fords Soon To Compete In U. S. Auto Market

Detroit

• • • A modification of the For light car originally designed fo production in this country will b built in France, Henry Ford II re vealed during his first press confer ence since returning to this coun try. Scheduled to make its debu in October, the French light ca will compete in the upper-mediun to lower-high price range, Ford ex plained. The car will be powered b a 66 hp engine.

Ford said the Ford Motor Co has no immediate plans for intro ducing a light car in the America market.

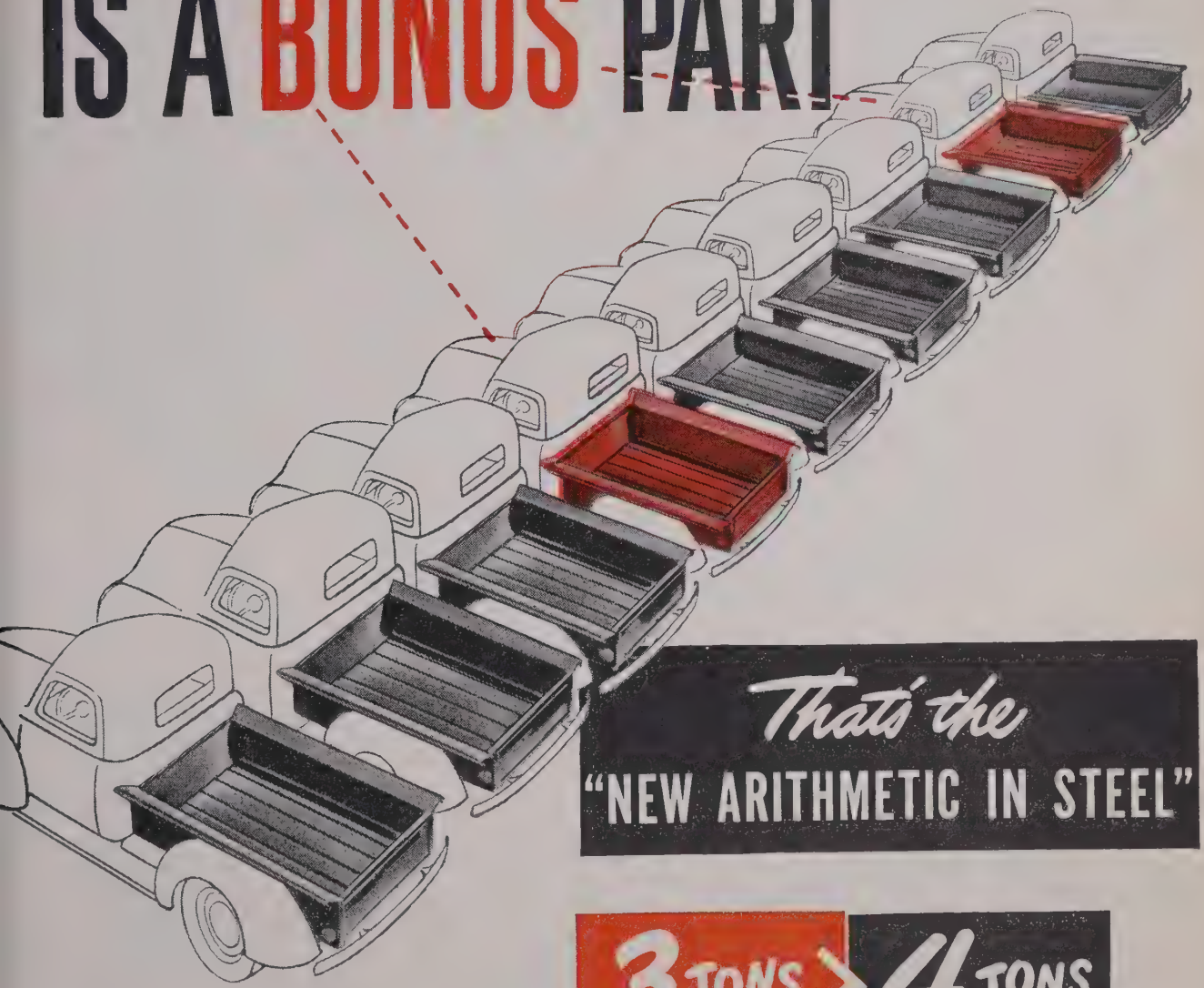
At the press conference, Ford dis closed that it is planned to brin about 6000 English Fords powere by a 30 hp engine to America About half of the import quota wil be "10 hundred weight vans,"— small panel-type vehicles especiall suited for light merchant deliver ies, he explained. More than 200 orders are on hand at present, i was reported.

Largest unit in the Ford Euro pean operating units is the plant a Dagenham, England, which assem bled 107,399 units during 1947. A new British postwar Ford is bein designed at present, Ford said.

It was reported that Ford o England exported 7200 motor ve hicles and tractors in January 1948 exceeding by 87 pct the exports o any other British motor manufac turer.

The first imports of Britis Ford light cars and trucks arrive in New York, April 19. Dealers ar located in Philadelphia, New York Washington, Wilmington and Bos ton.

EVERY FOURTH PART IS A BONUS PART



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Washington . . .

EUGENE J. HARDY

• European requirements not yet firm . . . Export programming on short-term basis likely . . . Prospects brighten for return of German scrap . . . Rep. Macy, R., N. Y., spurs return efforts.

WASHINGTON—Completely aware of the fact that industry is anxious to know the exact quantities of steel, farm machinery, trucks, freight cars, and other industrial commodities to be exported under the European Recovery Program, officials of the newly-created Economic Cooperation Administration this week told THE IRON AGE that no one is in a position to state just how much will be shipped in the first month, quarter, or year.

Estimates are available from a number of sources and new estimates are being prepared for submission to the Appropriations Committees of Congress, but at the moment ECA is not able to put forth any concrete requirements.

Until the ECA organization is in operating condition "serious thought cannot be given to long-range policies and procedures," according to Gaston Marque, special assistant to Administrator Paul Hoffman. This organizational work will not be completed for at least another 2 weeks.

It is planned to set up an Iron and Steel Section within ECA, as well as sections covering other commodities to be exported. Industry advisory committees are also in the cards at the present time.

Programming of exports under ERP is expected to be on a relatively short-term basis, probably on a quarterly pattern similar to that in effect for large-scale wartime procurement. The programs will be very flexible and subject to constant review by ECA officials, despite the oft-reiterated intention of the Administration to channel most industrial procurement through private firms, rather than government purchasing agencies. This review will be necessary to insure the proper use of funds made available by the United States.

The industrial portion of the program is as subject to change as is the overall effort. The House Foreign Affairs Committee report on the ERP bill, taking into consideration crop conditions, price changes, the tight situation in petroleum and steel in the United States, and the wide variation in amounts that may come from other Western Hemisphere countries, summarizes this situation as follows:

"No one can tell now whether in the 12 months before us 5.3 billion dollars will be necessary or whether it will be cut back safely to 4.3 billion dollars, or whether even without a further turn for the worse in European political events the contemplated program might cost as much as $6 billion or $7 billion."

* * *

INDUSTRY scrap experts are greatly encouraged by new developments in the campaign to import an estimated 10 million tons of rubble scrap now in Germany.

Rep. Macy, R., N. Y., chairman of a House Public Works investigating subcommittee, has spearheaded efforts in the House to place at least a part of this enormous scrap pile in the hands of the U. S. steel industry. While both government and industry officials are in complete agreement that (a) steel scrap is badly needed, and (b) there is no reason why the U. S. should not latch on this stockpil and bring it home for domestic use the buck-passing of responsibilit from one agency to another has un til this week dimmed prospects o early return of the badly-neede material.

Hearings conducted this week b Rep. Macy and John T. M. Reddan subcommittee counsel, brought ou that the principal delay in arrang ing for return of this scrap rest with Defense Secretary Forrestal Army officials testified that the nu merous authorizations for transfe of the scrap from military to civi officials in Germany required "considerable amount of time" an promised to push plans for acquir ing title.

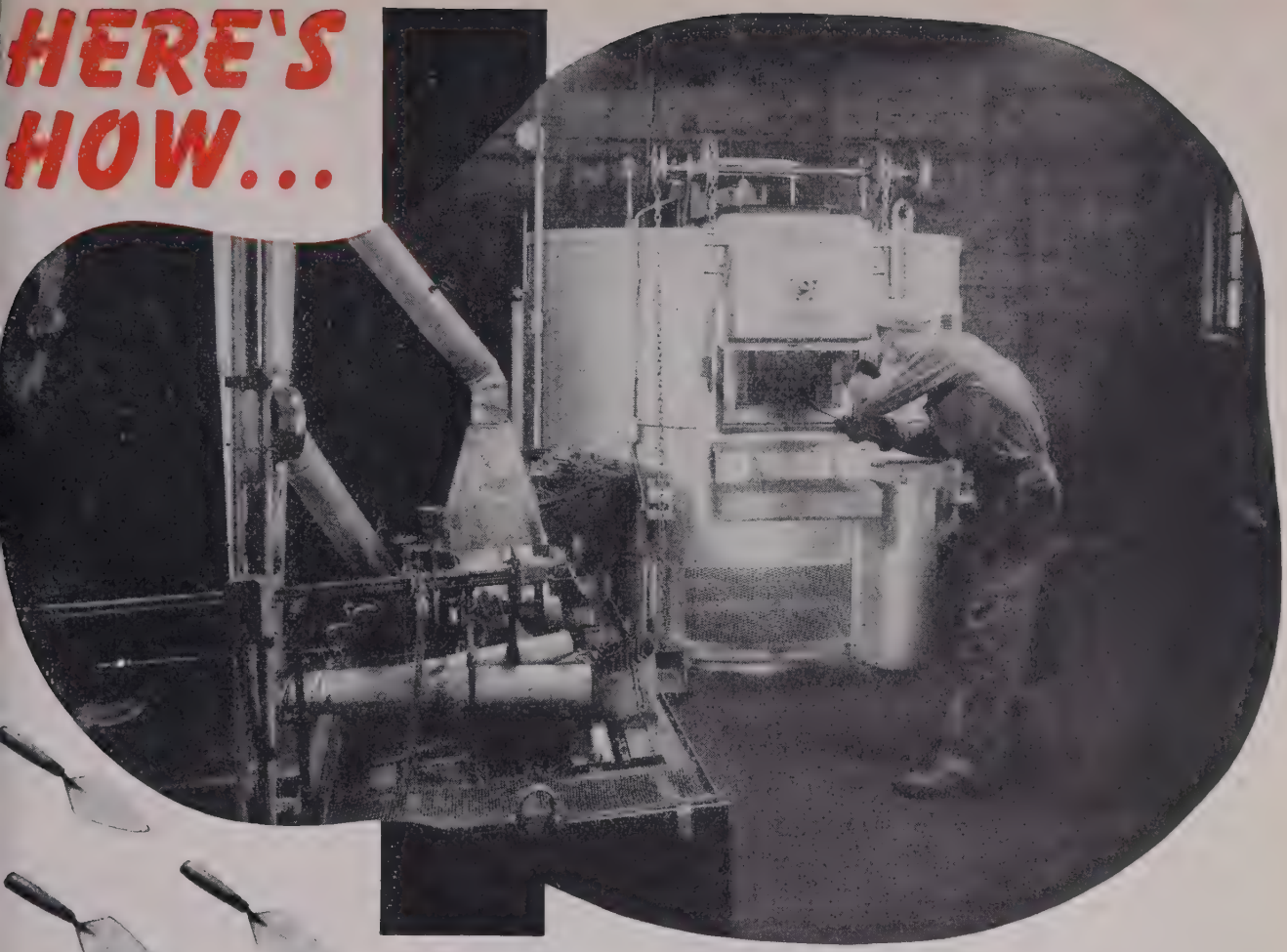
Officials of the Maritime Com mission told Mr. Macy that plenty of shipping space is available i bottoms currently returning from Europe. A number of relief ship make the return voyage to the U. S virtually empty, they pointed out.

Army officials, however, are un der pressure from German busi nessmen to allow the rubble scra to remain where it is for use in re building the German steel industry. And despite the fact that the recen government-industry scrap missio made careful investigation of vir tually all scrap piles in the Bizonia area before publishing its estimate of a maximum of 10 million tons, some occupation authorities claim the amount is much less than this.

THE scrap is now so intermin gled with concrete and othe foreign material that it is impossi ble to come up with an accurate estimate of the amount available, they declare. They claim that much of the 10 million-ton figure is "water", and that sorting and col lecting of the scrap will disclose the figure to be much lower.

Mr. Macy, however, told repre sentatives of the Defense Dept. that the 10 million-ton estimate was "not excessive", and warned that the program of arranging for im mediate return of the scrap "should be effectuated without delay."

HERE'S HOW...



. . . LINDBERG FURNACES HARDEN AND DRAW TWICE AS MANY TROWELS DAILY and . . .

. . . Increase production per man hour by 5 times . . . Reduce fuel cost ⅓ . . . Increase production per sq. ft. of floor space 60%

Marshalltown Trowel Company, well known trowel manufacturers of Marshalltown, Iowa, installed a new Lindberg Rotary Hearth Hydryzing Furnace and a new Lindberg Gas Fired Cyclone Drawing Furnace. Check this "Before and After" story of fuel cost reduction—production increase and uniformity improvement.

NOTE: Figures cover hardening and drawing production on just one size trowel. This same equipment is used for other types and sizes of trowels—with similar improvements in production, fuel costs, etc.

RALPH W. WILLIAMS

Production Manager of Marshalltown Trowel Company says: "We installed this equipment about 12 months ago, and our savings already are more than half the cost of the furnaces. At this rate we'll have the furnaces paid for in another year. We also find that these new furnaces make working conditions much cooler and cleaner."

BEFORE	AFTER
Equipment Used One open oil fired semi-muffle furnace 24" x 60" and one oil fired draw straightening furnace.	**Equipment Used** One Lindberg Rotary Hearth Hydryzing furnace (48" dia.) and one Gas Fired Drawing furnace (16" x 24").
Fuel Cost Per Trowel $.0050	**Fuel Cost Per Trowel** $.0032
Production Per Man Hour 50 Trowels	**Production Per Man Hour** 250 Trowels
Production Sq. Ft. Fl. Space Per Day 23 Trowels	**Production Sq. Ft. Fl. Space Per Day** 37 Trowels
% Of Work Necessary To Re-Heat-Treat To Insure Perfect Hardness Uniformity. 7% hardening and 6% drawing	**% Of Work Necessary To Re-Heat-Treat To Insure Perfect Hardness Uniformity.** No re-runs

LINDBERG ENGINEERING CO. 2452 W. Hubbard St., Chicago 12, Ill.

LINDBERG FURNACES

WAA Plans To Throw $350 Million Worth Of Tools On Market

Washington

• • • **Stepping up its** efforts to dispose of remaining industrial machinery and equipment, WAA plans to throw some $350 million worth on the market for competitive bidding after it has been screened by JANMAT for potential military set-asides.

Most of this equipment has formerly been offered on a fixed price basis. Some few items, still in short supply, will be held out for fixed price sale.

Following its recently adopted policy, WAA will offer the equipment to bidders during a 30-day inspection period. Materials left after the 30 days will be sold on a tonnage basis with other scrapped equipment.

Included in the clearance program is $93 million worth of electrical equipment, $64 million worth of internal combustion engines, $43 million worth of materials handling equipment, $30 million worth of furnaces and other heat-treating equipment, $26 million worth of metals processing equipment, $37 million worth of parts and components for the foregoing, and about $60 million worth of other assorted items.

A new price schedule has been put into effect for equipment selected by JANMAT but released for industrial users on request. Equipment not purchased at the new prices will be returned to the stockpile of stored equipment. The new schedules are: N-1, 90 pct of acquisition cost; N-2, 85 pct; N-3 and O-1, 80 pct; O-2, 70 pct; and O-3, 60 pct.

A. Miller Appointed to OIC

Washington

• • • **Alex Miller,** vice-president of the Columbia Iron & Metal Co. and also the Universal Steel Co., both of Cleveland, has been appointed special consultant to Director John C. Virden, OIC. During the war, Mr. Miller first headed the WPB iron and steel scrap section, later became chief of the agency's materials branch, and finally became assistant director of the WPS Steel Div. He returned to private industry in 1945.

THE BULL OF THE WOODS — BY J. R. WILLIAMS

NLRB Rules Pension Plans Are Subject to Bargainin

Washington

• • • **In a 4-1 rulng affecting** vi tually all industry, the NLRB ha ordered Inland Steel Co. to bargai on pension plans with the CIO United Steelworkers in the firm Indiana Harbor and Chicag Heights plants. The order was co ditioned upon the locals complyin with filing and affidavit provisio of the Taft-Hartley law.

The Board held that pensions c retirement plans fell within th term "wages" and ages and othe provisions as meaning "conditio of employment." Equally far-reach ing in effect was the ruling tha the unions must be consulted pri to any changes in the plans; th implies that the unions must als

See p. 119 for news on steel labor wag outlook and pension problems.—Ed.

be consulted before instituting retirement or pension, even on firm's initiative.

It is expected that the pensio ruling will get close attention b every steel company in the country It may also be that some steel firm will want to change the plans the have in light of the NRLB rulin

The pension ruling was expecte to be a sharp blow to industri relations people who have held fo years that pension plans were th sole perogative of managemen Furthermore it means, according t steel observers, that many change will be asked for in present plan by the steel union.

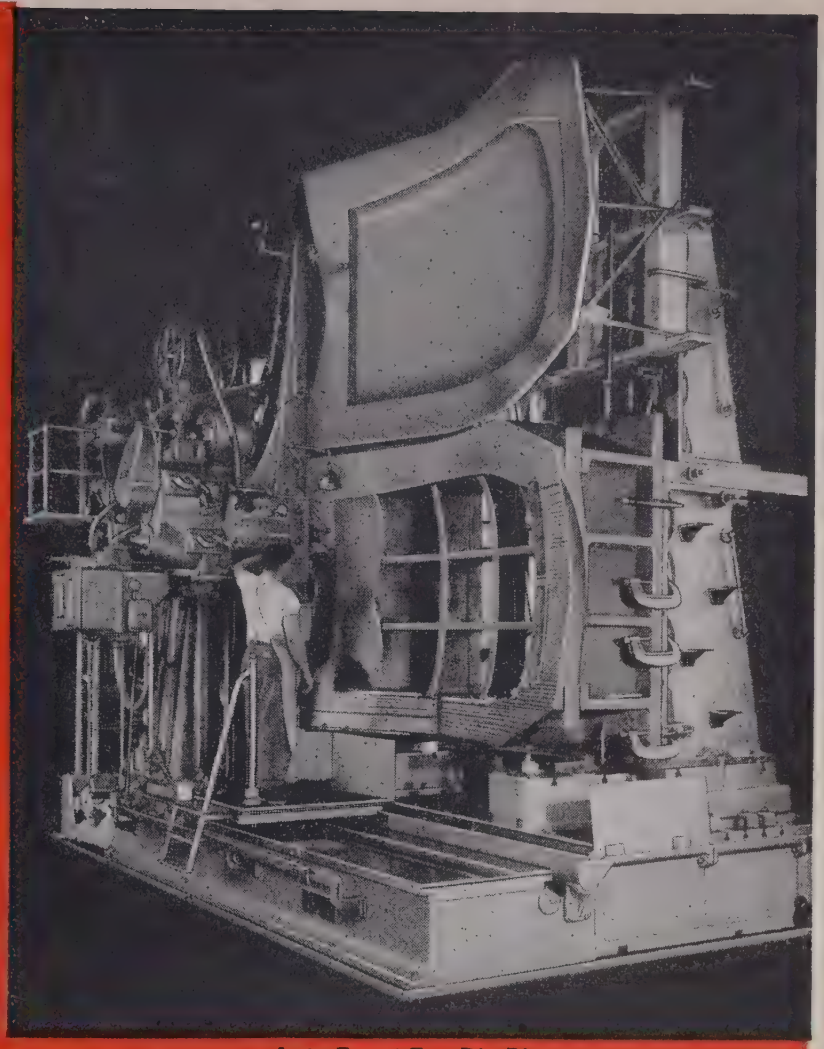
The United Steelworkers o America have not as yet qualifie under the Taft-Hartley Bill. Bu according to union sources the ru ing is considered a major victor because of the basic nature of th decision.

Wheeling Will Use Oxyge

Wheeling, W. Va.

• • • **Wheeling Steel Corp.** ha completed arrangementsb wit Linde Air Products Co. for installa tion of a 135-ton a day oxygen plan at the Steubenville, Ohio, works. I making the announcement, Whee ing officials said it would be used t increase the output of the com pany's 10 openhearths there.

BIG DIES



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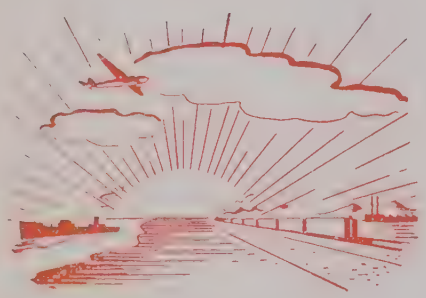
shipped within 24 hours

West Coast . . .

ROBERT T. REINHARDT

• Latest survey of Washington coal reveals large reserves . . . California manufacturers demand equalization of transportation and communication taxes . . . Utah labor hard hit by mine walk-out.



SEATTLE—With coal in the forefront of the news within the past few weeks, the importance of this mineral in the economy of the Northwest is again being studied.

In a report released by Stephen H. Green titled, Coal and Coal Mining in Washington" and prepared under the Division of Mines and Geology for the State of Washington, it is pointed out that coal is one of the most abundant resources of the state and it is reported that "there is ample tonnage available for all requirements that can now be foreseen, both industrial and domestic, not only for the present but for hundreds of years to come."

Total coal reserves for the State of Washington were reported in 1913 by the U. S. Geological Survey and a revision made in 1925 to the effect that reserves amounted to approximately 63 billion tons. It is reported that if a new survey were made at this time, probably these figures would be increased appreciably and that the bulk of this material is bituminous and sub-bituminous.

From 1860 up to and including 1946 approximately 139 million tons were mined. The report indicates that there is obviously still in excess of 60 billion tons of coal remaining in reserve in this state alone.

First available records indicate that coal production in 1860 amounted to 5374 tons and that production increased until 1918 when a peak of 4,128,424 tons were produced. From that time there was a decline in activity until 1934 when the smallest tonnage was mined of any year since 1897. This decline is attributed to the greatly increased use of fuel oil, both for industrial power and domestic heating; increased use of electricity and gas for domestic heating and cooking; and in some measure, change in economic conditions. The trend was upward after 1934 and production for 1946 is reported in Mr. Green's report as being approximately 1 million tons and it is implied that increased production should continue.

Principal coal deposits are located on the west slope of the Cascade Mountains with the counties of Whatcom, Skagit, King, Pierce, Thurston, Lewis, and Cowlitz all having important fields. One major field is located on the east flank of the Cascades in Kittitas County. Unimportant deposits are reported as being located in Asotin, Clallam, Chelan, Snohomish, Stevens and other counties. This report indicates that the only large and commercially important supply of coking coal in the Pacific Coast states is located in Pierce County and is said to be possibly valuable in the event of the establishment of an iron industry in the state. Coking coal has also been mined at Cokedale in Skagit County although this mine has been closed for sometime. Mr. Green indicates that coal from the Roslyn-No. 3 seam makes a fair grade of coke but that at the present time the entire production is being used for other purposes.

Anthracite is said to be found in both Whatcom and Lewis counties but that no commercial development has occurred in these areas.

PRODUCTION of coke in Washington started in 1884 when 400 tons were produced by the Tacoma Coal & Coke Co. at Wilkeson. By the year 1919 there were 457 beehive ovens in operation in the state and in 1914 the Seattle Lighting Co. constructed five Klonne-type byproduct ovens in Seattle.

The primary purpose of these ovens was the production of gas and the coke was sold principally for domestic use but some of the material was reportedly used for metallurgical purposes.

Peek production of coke was reached in 1915 when 136,552 tons were produced and from that date forward production decreased until 1937 when all production of coke in the state ceased.

Wilkeson Products Co. in 1944 installed a battery of 17 Curran-Knowles by-product ovens at Tacoma, which had an annual capacity of 75,000 tons of coke, 900,000 gal of tar, and 450 million cu ft of gas. However after a few months operation this plant was closed down late in 1944. The tar had been sold directly to distillers and the gas was sold for domestic and industrial needs. The coke produced was used largely for electrometallurgical purposes.

In spite of the large deposits and reasonable accessibility of these mines to consuming centers there has been a lack of sufficient coal to take care of local market requirements. The state Division of Mines and Geology has completed surveys to determine the reason for this situation which brought about the importation of more than a million tons of coal from other states during the 6 months from October 1942 to April 1943. During 1946 approximately 1½ million tons were imported from other states. Principal cause of the shortage of mined coal is said to be the lack of miners and the need for greater mechanization.

* * *

LOS ANGELES—Strenuous efforts to combat rising costs are being made by manufacturers in California, according to O. W. Carlson, treasurer, Axelson Manufacturing Co., Los Angeles, and southern California chairman of the

Complete trolley for overhead conveyor. Each trolley consists of two wheels and two brackets. Both wheels and brackets are TOCCO-hardened. *(Photo courtesy Link Belt Co.)*

HARDENING COSTS CUT 75%

with TOCCO* Induction Heating

● This TOCCO-hardened conveyor trolley bracket may be a long call from *your* product, but its case is typical of the savings accomplished by induction heating of metal parts of all sizes and shapes. Note these advantages:

1. CUTS COSTS—Hardening cost per bracket has been cut 75% by the adoption of induction hardening. Present cost is just one-fourth of cost when conventional hardening methods were employed.

2. STREAMLINES PRODUCTION—TOCCO eliminates carburizing, hauling and sandblasting—can be placed right in production line, next to related operations.

3. IMPROVES PRODUCT—TOCCO hardens wearing surface only—thus preserves original toughness and ductility of remainder of part.

TOCCO Engineers are glad to explore your operations for similar cost-cutting improvements—without obligation.

THE OHIO CRANKSHAFT COMPANY

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FREE BULLETIN

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Dept A-4, Cleveland 1, Ohio

Please send copy of "TOCCO Hardening".

Name_____

Position_____

Company_____

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Taxation Committee, California Manufacturers Assn.

At the recent session of the California Legislature a law, sponsored by the California Division of Industrial Safety, was proposed which would have substantially increased inspection fees paid by manufacturers of tanks and boilers. The legislation was opposed by members of the metalworking industry, in conjunction with CMA and the California Liquid Petroleum Gas Tank Mfrs. Assn., and others, on the ground that insufficient analysis had been made of the measure, Mr. Carlson stated.

Operators in the metal trades have been especially active in the effort to eliminate or equalize the present punitive federal excise tax on transportation and communications. Strong representations have been made through agencies of the California Mfrs. Assn. to Congressional committee members, protesting the unfair burden placed on western industry by this tax. Enacted as a wartime emergency measure, the tax includes a straight percentage levy on freight bills. Pacific Coast shippers, already at a geographical disadvantage and smarting under cumulative rate increases totaling 48 pct since June 1946, can ill afford this additional percentage burden. They seek its elimination or modification to a flat amount falling equally upon all, Mr. Carlson said.

Typical of the discrimination complained of, Mr. Carlson calls attention to the fact that on a 10,000 lb shipment of first-class freight, the excise tax from California to Illinois has increased by $8.00 while the tax on an identical shipment from New York to Illinois has increased by slightly more than $2.25. Thus, although the distance ratio is about 2.5:1, the tax ration is about 3.5:1.

* * *

SALT LAKE CITY — Last week as the black shadow of the coal "strike" began to dissipate, Geneva Steel Co. began the slow task of getting back into capacity production.

Having been on short coal rations for sometime the mine walkout brought the rolling mill to a complete standstill and only one battery of coke ovens and one blast furnace were operated at reduced rates toward the end of the walkout. Two openhearths were pouring token heats and the working force had been reduced from 4300 to about 3000 persons.

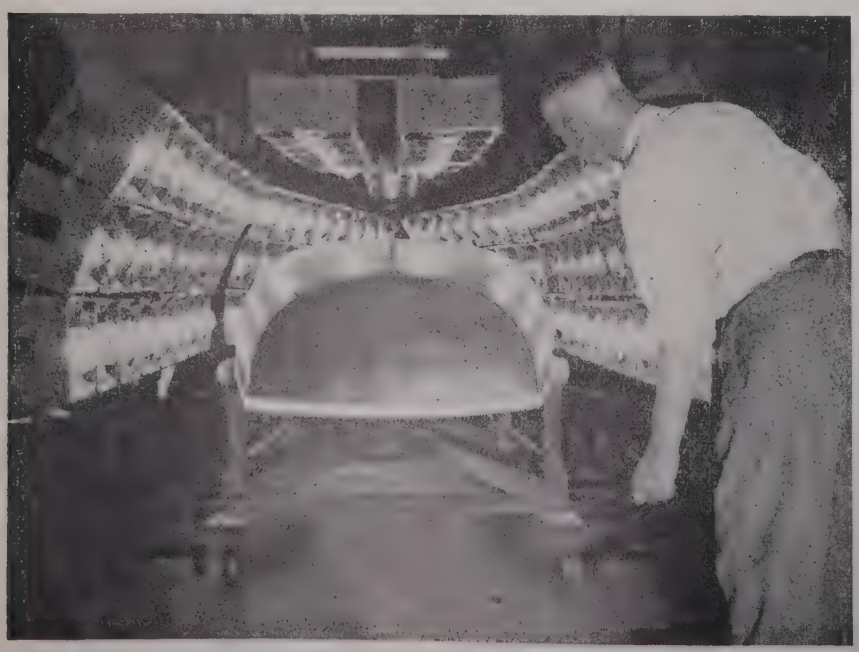
Pacific States Cast Iron Pipe Co. had to lay off 350 men because of the stoppage of pig iron supply.

The chain reaction of the miners walkout was indicated by the probability that Standard Oil of Calif. will be delayed in the installation of its $5 million pipeline from Rangely and construction of its new refinery in Salt Lake City. Much of the steel is coming from the Geneva Co. and a contract for tankage has been let to the Chicago Bridge & Iron Co., which is completing the first unit of a new fabricating plant here. Officials of Kaiser & Frazer Parts Co., Inc., have been expecting to get the 500 beehive coke ovens at Sunnyside reconditioned and ready for operation this week. Start of coke production of course will depend upon the availability of coal now that the "strike" is apparently ended.

The mine tieup has idled more than 5000 miners, steelworkers and railroad men in addition to those laid off at the Geneva Steel Co.

J. R. Simplot Co. has placed an order with the Dorr Engineering Co. of New York for approximately $2 million worth of equipment for conversion of the war surplus Kalunite plant to the production of fertilizer. Now that the Justice Dept. has approved the sale of this property, Mr. Simplot has announced that work on the conversion would start as soon as engineering plans are completed.

ALUMINUM BOATS: Equipment and material formerly used in planes is now used in the mass production of two models of all-purpose rowboats at the Santa Monica, Calif., plant of Douglas Aircraft Co. This is an 80-lb model under the infrared drying lamp booth.



New Allocation Plan For British Steel Industry Operating

London

• • • **The new arrangements** for the distribution of British Iron and Steel came into operation at the beginning of this month. Under the new allocation plan all outstanding orders for iron and steel other than sheets and tinplate have been cancelled.

Consumers have received new authorizations or sub-authorizations from their customers for their requirements from Apr. 1. There is a provision in the new plan for exemption from cancellation of authorization for work completed or in progress but not delivered by March 31, in approved cases, but the number of such exceptions has been small and a large amount of steel has been erased from makers' order books.

THE UDYLITE WAY...

• *At least 50% increase in plating speed*—that's the proved accomplishment of Udylite's Bright Nickel Process.

This means 50% more plating with the same voltage, in the same time, without additional manpower or costly equipment alteration.

The Udylite Way to faster bright nickel is based on specially developed Udylite Brighteners in a high-chloride bath. The result is not only *faster* plating but definitely *better* plating because the Udylite Process offers the following advantages: Exceptional tolerance to contamination; uniform deposits over a wide range of current densities; high rate of brightening; less tendency to form nodules; simple to operate and control.

A Udylite Technical Man will gladly tell you all the details of the Udylite Bright Nickel Process and show you how Udylite research has developed processes tailored to your own plating need. Write, wire or 'phone the Udylite Corporation, Detroit 11, Michigan. Offices in Principal Cities.

PIONEER OF A BETTER WAY IN PLATING...

TESTED SOLUTIONS • TAILORED EQUIPMENT
AUTOMATIC CONTROL FOR METAL FINISHING

THE Udylite CORPORATION

PERSONALS

W. H. BROWN, president, Hoskins Mfg. Co.

• **W. H. Brown,** formerly assistant general manager of Hoskins Mfg. Co., Detroit, has been named president and chief executive officer. He came to Hoskins in 1939 as technical assistant to the factory superintendent. He has since served as factory superintendent and assistant general manager, and on the board of directors. **W. D. Little** has retired as president and general manager of the company, but will remain on the board of directors, of which he was recently named chairman.

• **David M. Salsbury** has been elected president of the Westinghouse Electric Supply Co., Pittsburgh. Mr. Salsbury has been executive vice-president of WESCO, a wholly-owned subsidiary of the Westinghouse Electric Corp., since 1946, and vice-president since 1944. He succeeds **B. W. Clark,** who has held the dual posts of president of WESCO and vice-president in charge of sales of the parent company.

• **Ben F. Hopkins,** president of the Cleveland Graphite Bronze Co., Cleveland, has become chairman of the board, and **James L. Myers** has moved from executive vice-president to the presidency of the company. **Carl W. Johnson** has advanced from vice-president in charge of sales to senior vice-president, while **J. J. McIntyre,** senior vice-president, becomes vice-chairman of the board.

o o o

• **A. G. Pratt,** president of the Babcock & Wilcox Co., New York, has been elected chairman of the board, and **Alfred Iddles,** previously a vice-president, has been elected president and chief executive officer of the company. Mr. Pratt has been with the company for 45 years, during 7 of which he served as a vice-president and 24 years as president. Mr. Iddles joined the company in 1937 and became a vice-president in 1945. **W. T. McCullough, Jr.,** in charge of stationary boiler sales and formerly sales manager of the Chicago office of the company, has been elected a vice-president, and **W. G. Dryden,** formerly treasurer, has been made secretary and treasurer. **C. W. Middleton,** vice-president and secretary, has withdrawn from full-time active service in the company but will continue as a director and in a consulting capacity.

• **Robert J. Dods** has been appointed assistant traffic manager and **Harry L. Aufderheid,** general traffic supervisor of Carnegie-Illinois Steel Corp. and various other U. S. Steel subsidiaries in the Pittsburgh district. Mr. Dods was first employed by Carnegie-Illinois in 1916, and has held the position of general supervisor, traffic, since 1944. Mr. Aufderheid's service with U. S. Steel began in 1920. He has held various positions in the traffic department since that time and leaves the post of supervisor of the rate and route bureau to fill his present appointment.

• **William J. Ryan,** formerly mechanical superintendent, has become assistant to the general manufacturing manager of the New Departure Div. of General Motors Corp., Bristol, Conn. **Harry Simpson,** assistant superintendent of the forge plant, has been appointed acting mechanical superintendent. **Harold Draper,** foreman of the Transitory department, has been appointed senior engineer in the mechanical department under the direction of the mechanical superintendent. **Herbert A. Maronn,** grinding wheel supervisor for building 32, has been made abrasive supervisor for all departments.

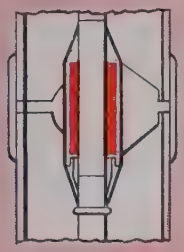
EDMUND G. PRICE, vice-president in charge of operations, National Tube Co.

• **Edmund G. Price** has been elected vice-president in charge of operations of National Tube Co., Pittsburgh. He succeeds **E. N. Sanders,** who becomes assistant to the vice-president of engineering and operations, U. S. Steel Corp. of Delaware, Pittsburgh. Mr. Price joined National Tube in 1924. He was appointed general superintendent of the company's National Works at McKeesport in 1946, where he served until his election as vice-president.

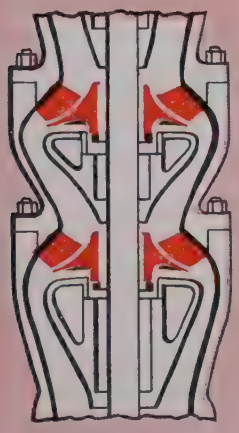
• **John H. Smith** has been appointed executive vice-president of General Electric X-Ray Corp., Milwaukee. Mr. Smith has also been elected a member of the board of directors. He was formerly vice-president in charge of the marketing division. **Robert L. Lefevre** has been appointed marketing manager of GE X-Ray. Until recently he was sales manager of the firm. **Willard J. Cox,** formerly assistant sales manager, replaces Mr. Lefevre as sales manager.

• **Dr. Daniel E. Bonnell** has been appointed vice-president in charge of sales of the Chemical Corp. of Colorado, Denver. After serving in the Army, Dr. Bonnell was appointed plant manager for the Velsicol Corp., a position which he retained until he became director of public relations for Julius Hyman & Co. of Denver.

EASY ADJUSTABILITY. With one simple "at the surface" adjustment, you can vary capacities over a wide range without power-wasting "throttling." Adjustment nut can also be used to compensate for wear . . . assuring new pump efficiency *for the lifetime of the pump!*



QUIET, SMOOTH OPERATION. Pomona's revolvable rubber shaft bearings assure vibration-free shaft support under all conditions.



FREEDOM FROM SAND-LOCKING. You won't have any costly stoppages with Pomona. Open impeller design assures complete freedom from sand-locking . . . minimizes wear . . . eliminates the need for sealing or wearing rings.

WATER LUBRICATION. Pomona's *true* water lubrication is your guarantee of clean, clear water. Water lubrication also means simplicity of design with fewer working parts for maximum dependability, lower operating costs, less maintenance.

IT isn't just chance that Pomona gives you all the features you've always wanted in a vertical turbine pump. Lowest-cost-per-gallon service . . . unequalled dependability . . . simplicity of installation and maintenance, these are "designed-in" features resulting from years of experience. Just check these features. You'll find what you want!

WHAT YOU WANT IN A PUMP YOU GET WITH

POMONA!

CHECK THESE and other "wanted" Pomona features with your Fairbanks-Morse Pomona dealer or branch pump engineer. They can show you how the Pomona line . . . sizes from 4 to 36 inches, capacities from 15 to 20,000 G.P.M. . . . gives you more!

Fairbanks, Morse & Co., Chicago 5, Ill.

FAIRBANKS-MORSE

A name worth remembering

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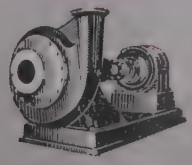
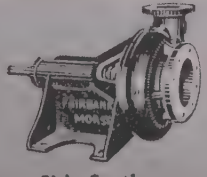
STOKERS • RAILROAD MOTOR CARS and STANDPIPES • FARM EQUIPMENT • MAGNETOS

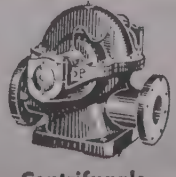
A FEW OF THE COMPLETE LINE OF FAIRBANKS-MORSE PUMPS



Trash Pumps



Side-Suction



Centrifugals

Builtogether

European Letter . .

• Marshall Plan passed for the peaceful economic reconstruction of Europe . . . American public is qualifying for title of least isolationist and self-absorbed of peoples.

LONDON—Men lose their capacity for astonishment very easily. Let a thing be mentioned often enough and they begin to accept it as a normal unsensational fact. Few things have been mentioned more persistently in the last 10 months than the chances and the hopes and the possibilities offered by the Marshall Plan. Insensibly, people have grown used to it. Its fabulous quality has been stripped away.

But now, since the Plan is no longer just a hope or a chance but a concrete reality—an Act approved by Congress and signed by the President, provisional funds already granted, ships already sailing with supplies from American harbors—it is fitting that the peoples of Western Europe should attempt to renew their capacity for wonder, so that they can return to the United States a gratitude in some way commensurate with the aid they are about to receive. For a day or two, the Marshall Plan must be retrieved from the realm of normal day-to-day developments in international affairs and be seen for what it is—an act without peer in history.

In time of peace, in order to aid nations geographically remote and politically separate from the Americas, at a time of great internal shortages, the United States is ready to give away over $5 billion worth of commodities as the first installment of a wider program, to give them for peaceful economic reconstruction and, save for minor exceptions, to give them without political conditions of any sort.

A years ago, the project would have been inconceivable—Congress was then making desperately heavy weather over only $400 million for aid to Greece and Turkey. Ten years ago, such an initiative would have driven the nation *en masse* into the arms of the America Firsters. And search back as one may through the annals of the United States or of any other Power, there is no record of a comparable act of inspired and generous diplomacy.

SO, with their sense of astonishment restored, the peoples of Western Europe must offer their thanks to the American nation who, through their Congress, have now spoken for the Bill. It will be difficult, after this demonstration of international solidarity, to go on repeating the old gibes about American isolationism, the old complacent references to American political immaturity. In recent months, the American public, in its eagerness for information, its sustained interest in foreign affairs, and in its acceptance of positive and onerous international responsibility, is rapidly qualifying for the title of the least isolationist and self-absorbed of peoples.

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And this development in turn is due, above all, to the work of a small group of leaders, on whose vision and devoted labors the successful development of the Plan has depended, on Mr. Marshall and Mr. Acheson for the sweep and courage of the initial project, on Mr. Vandenberg and Mr. Lewis Douglas, among many others, for the skill and patience — and speed — with which it was piloted through both Houses of Congress. This last point of speed is clearly vital. How often in the last 20 years has the reaction of democracy come too little and too late; but this time, the initiative has been captured and held by the party of freedom.

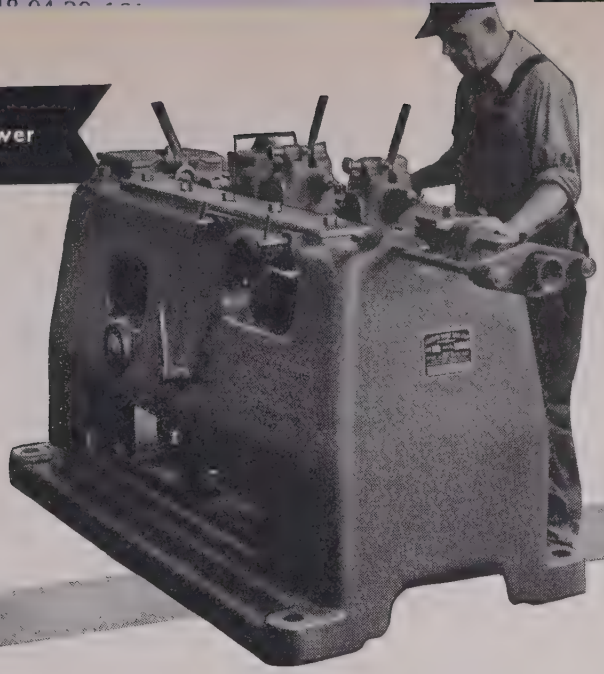
It is true that the Russians carry a large measure of responsibility for the breakneck speed (by American standards) of the debates on the Plan in the House of Representatives, all of which took place after the Communist coup in Prague. But there is no reason to suppose that, without the lesson of Czechoslovakia, the House of Representatives would have given a decision different from the Senate's, for which the ground-work had been fully laid before the seizure of Czechoslovakia, even though the debate might have been larger and more discordant. Nor has the Bill been loaded with military and strategic commitments or diverted in any way from its original fundamentally constructive and pacific purpose. It emerges from its Congressional ordeal as it went into it—as a Bill for the peaceful economic reconstruction of Europe.

NEVERTHELESS, there is a warning to Europe in the extent to which Russian action has speeded up the final phases of the Marshall debate. For the sake of peace in Europe, it must be hoped that, as the Plan develops, its pacific character will become more and more obvious, Russian opposition will decline and the effectiveness of Communist opposition be hamstrung by growing economic prosperity. When in a year's time, and 2 years' time and 3 years' time, the further appropriations come to be voted by Congress, it should be assumed that the spur of the Communist menace may be less sharp than it is today.

Under such conditions, will Congress find the Plan a sufficiently worthwhile end in itself? Will the prospect of continuing a pacific effort of international reconstruction be compelling enough to call forth further dollars? The answer lies in one thing only—the way in which the European nations themselves go about their work of recovery.

Chilton's Iron Age 1948 04 29 121

No. 4 AJAX-HOGUE Wire Drawer

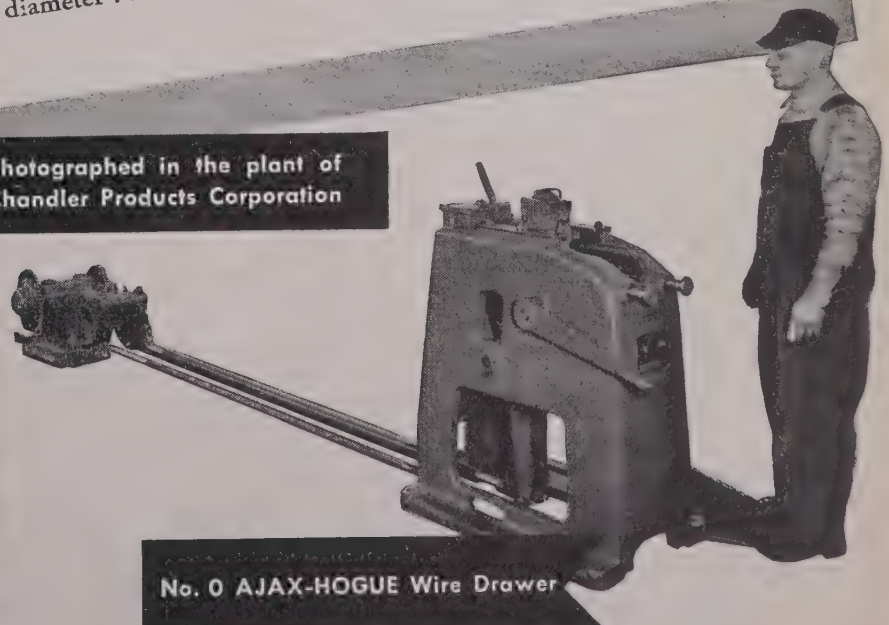


★Can be attached to any make and type of Cold Header—driven from the crankshaft.

A LOWER YIELD POINT FOR HIGHER QUALITY THROUGH AJAX-HOGUE WIRE DRAWERS

● Cold heading, at a high rate of production, to close tolerance at reduced cost is achieved by using AJAX-HOGUE wire drawers driven directly by cold headers. Freshly drawn and coated wire has a lower yield point as it is fed to the header dies. This low yield point of the wire allows the metal to flow more freely, filling out the die impressions to a high degree of accuracy and uniformity. And the wire is given a clean coating free from foreign matter so often encountered in the use of wire not freshly drawn. AJAX-HOGUE wire drawers are built in five sizes with capacity from 1/4 inch to 3/4 inch diameter . . . *Write for Bulletin No. 111.*

Photographed in the plant of Chandler Products Corporation



No. 0 AJAX-HOGUE Wire Drawer

THE AJAX MANUFACTURING COMPANY

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DEWART BUILDING NEW LONDON, CONN.

Industrial News Summary...

- ***Steel Loss 1.5 Million Tons***
- ***Auto Industry To Be Hard Hit***
- ***Controls Loom Ahead For Steel***

IF the steel industry is to escape this year the imposition of strict government controls it must talk fast and long. Before the coal strike most steel delivery promises were being met on time. That good position is now washed out. Because of the coal strike steel loss, the Marshall Plan and the certainty of defense requirements, steel supply is now tighter than at any time in the past 2 years.

The loss of steel because of the mine shutdown is far more serious than generally supposed. When the full figures are in, the loss will be more than 1.5 million tons of steel—an increase of 100,000 over the estimate made last week by THE IRON AGE. Slowness of the miners' return expanded the loss. Steel firms and their customers are this week realizing just how much distribution of steel has been knocked out of line.

The auto industry has been particularly hard hit. Not only because of the loss in regular steel shipments but because of the breakdown in conversion steel plans. A fair proportion of auto steel has come from conversion of semifinished steel. This has kept cries of shortages down to a whisper for months. Steel firms which were either supplying the semifinished steel for the conversion deals, or at least rolling the material, have had to renig on promises because of the coal strike loss.

Contrary to general ideas the loss of only 2 pct of total steel output is enough to throw off balance the delicate setup in steel distribution. Inventories which were small but in balance are daily becoming unbalanced. This unbalance—more bars than sheets, or more plates than bars—means trouble for manufacturers who must keep up a high rate of output.

MARSHALL PLAN needs could have been at least half met by the current loss of steel. These requirements will hit the country at a time when defense commitments will be in the air. The manufacturers' outlook which had been one of partial satisfaction with the steel picture was changing rapidly this week.

Administration leaders who favor a straightjacket for steel are finding the current supply picture playing into their hands in their argument for controls. The tendency of steel buyers will now be to take everything that is coming to them under the quota system. Quotas will be cut and many consumers will find their expected steel much smaller than their plans call for.

The huge demands from the oil industry plus defense plans when added to the coal mine setback are enough to produce a temporary situation which looks as if it needs controls. Only the general negative tener of Congress towards controls keeps them from being imposed in the near future. If the steel industry can get over this hurdle—get back to high output and stay there—it may escape a priority system which would pretty well mess things up.

Serious from the industry's standpoint are the private views of some officials. The road ahead, if no controls are imposed, will be hard for any and all steel sales people. Some customers will not get the steel they need or think they need. The so-called essential groups are bound to get a green light from steel companies under the threat that if they don't—the government will demand it.

This means placating customers, loss of some genial customer relationships and a general headache for steel sales executives. Because of this some officials—not all—would welcome priorities or any setup which would put the direct blame or responsibility for cutting down steel shipments to domestic users on someone else.

THE apparent need for allocations will loom large soon. The gray market barometer already points toward heavy activity so the steel industry will have to put up a tough fight to prevent steel distribution regimentation. It must also again defend itself on the capacity question which is sure to come up soon. Whether it does a successful job remains to be seen but it has plenty of arguments it can use.

A few of these are:

(1) Steel loss since the end of the war because of strikes has been more than 20 million tons. This would have been enough steel to have placed the industry on a normal balanced supply and demand pattern.

(2) The industry has not had the money to expand under present reconstruction costs. New ingot capacity from ore to produce costs from $200 to $300 a ton compared with less than $100 a ton when capacity was constructed.

(3) Many steel customers are taking more steel than they need. Because of the vast number of customers, policing of the end-use of steel is almost impossible. These customers easily find a way of selling their steel on the gray market. But after 2½ years no one has been able to pin the responsibility of the gray market on the industry.

(4) The steel industry is in business to make money. If wage rates are advanced it means prices will have to go up.

Even with all the arguments at its command and with Congress in no mood for controls the whole steel picture is entirely dependent on events abroad, and the speed with which this country rearms. If international news is seriously negative there may be no doubt about the passage of control measures—after the election in this country is over.

The freight rate advance this week is another hurdle for steel firms in their rising steelmaking costs. It is also further proof that the present steel price level is in for overhauling, after new labor costs are figured later this year.

HARCOAL BURNER—The $2 mili' n blast furnace, ted nearly 10 years ago at Rusk, Cherokee County, Tex., be completed and in operation about June 1. E. F. Crossin, Birmingham, is president of the reorganized ipany, The Valencia Iron and Chemical Co. H. Vai, formerly of Venezuela, is one of the principal stockers. Initial production calls for 100 to 125 tons of iron ay. The company has arranged for a coke supply from Lone Star Steel Co. of Daingerfield. It will later be verted to charcoal. If and when this happens it will be largest charcoal blast furnace in the world. The comy's present contract with Lone Star for coke is for 100 s of coke a day when operations begin.

UES GOVERNMENT—Monsanto Chemical Co. has a $50 million damage suit against the United States ernment for loss and damages resulting from the dection of its Texas City plant Apr. 16 last year. The includes damages to the Texas City plant, expenses rred and loss of profits resulting from the plant dection and for the loss of services of the technically ned and operating personnel who were killed in the ster. The company charged the government with the onsibility for the explosion, stating that although amium nitrate was known to be highly explosive and had used during the war for the bursting charge of bombs shells, the same material shipped in this case was cently labeled "fertilizer." The company also stated there were no precautionary notices or shipping docuts on the bags.

OUNDRY IRON—Forty thousand tons of Brazilian dry iron are offered at $94 a ton f.a.s. New York by John French Co., 70 Wall St., New York. The iron contracted for in order to supply the requirements of Flannigan Co., Chicago, manufacturers of school furni- and playground equipment. If sufficient demand at price develops in the United States, it is probable that tional iron could be imported, as some Brazilian ton- is now going to Italy. In 35 lb pig, the iron analysis s follows: Si 0.75 to 1.25, Mn 0.50 to 2.00, S 0.05 max., 40 max.

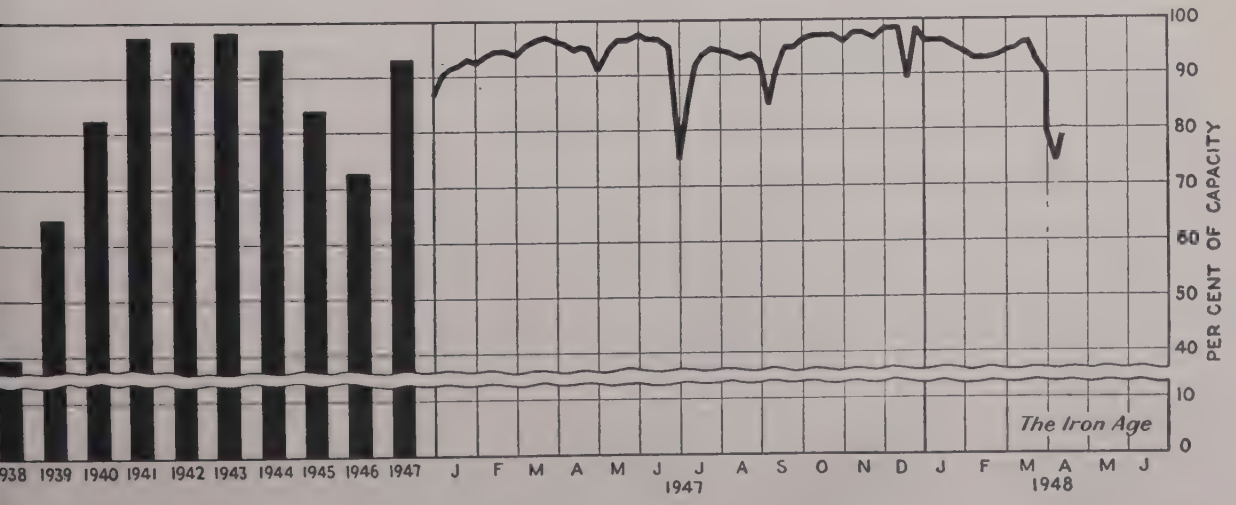
• **GONE FOR GOOD**—The coal strike has cost steel producers over 1,400,000 net tons of ingots, including direct losses to date plus delays in getting back to prestrike operating levels. Converted into finished steel and spread out among several consuming industries this would have provided enough steel to make 300,000 automobiles and 20,000 farm tractors plus 200,000 each of refrigerators, stoves and washing machines. There would still be enough left over to supply steel for 1000 miles of 20-in. oil pipe line, 10,000 freight cars and four oil tankers. Of course the country hasn't lost this exact amount of these specific products because the loss will be spread more evenly over a host of other steel products.

• **ALLOCATE BARS**—A tigher position in bars is indicated by the fact that the two largest producers have begun programs of allocation to consumers. Until recently, cold-finished bars were obtainable on 2 months delivery in the East and 5 to 6 months in the Midwest. This variation in delivery time was the cause of scheduling problems for the mills which are expected to be overcome by allocations.

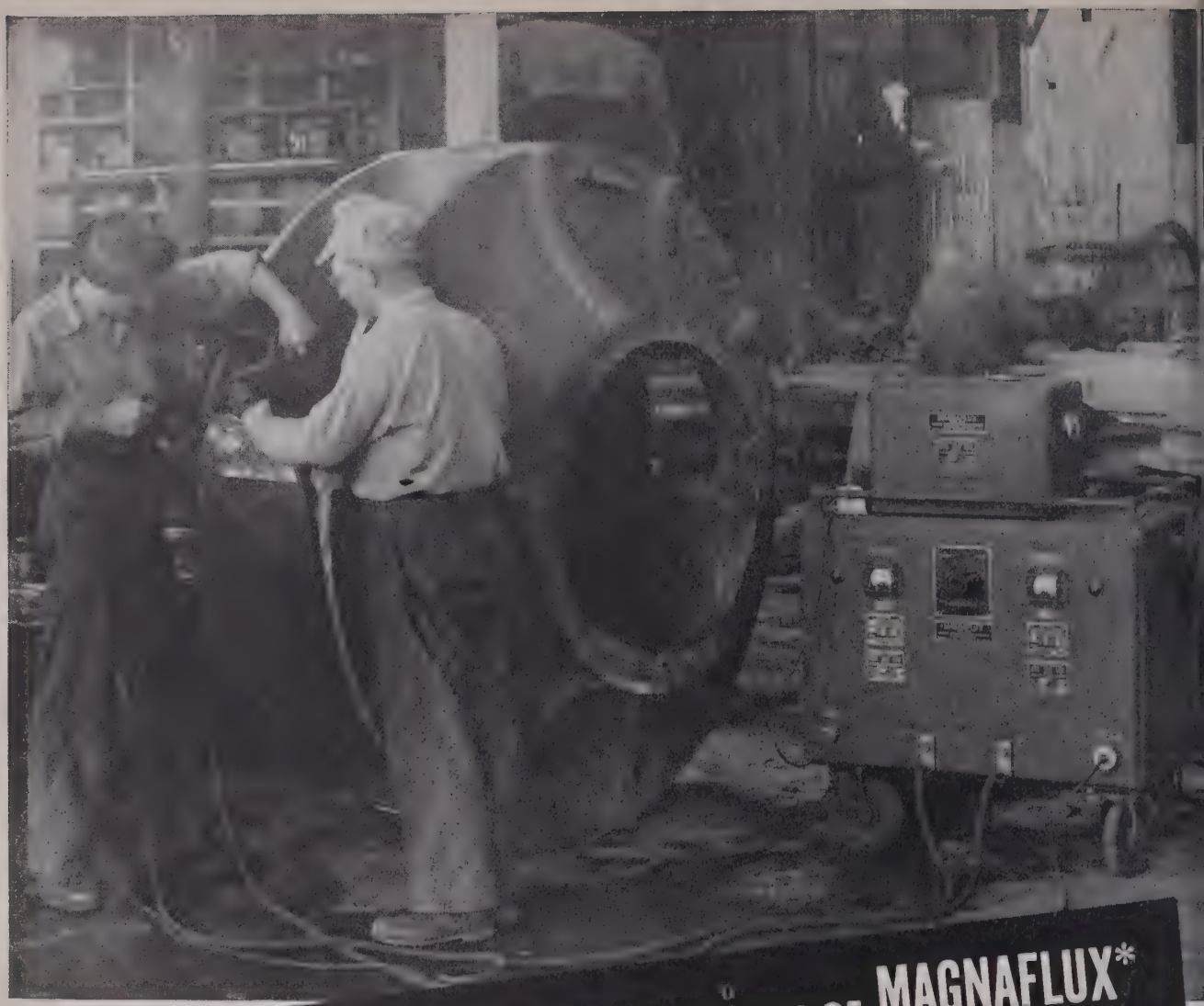
• **BETTER METHODS**—Improved manufacturing methods will be illustrated by a display of parts produced by various types of dies, molds, jigs and fixtures at the 4th Annual New England Conference of the National Tool and Die Manufacturers Assn., to be held Friday, May 14, in New Haven, Conn. The regional associations sponsoring the conference are the Southern New England Tool and Die Manufacturers Assn., the host, the Western Massachusetts Tool and Die Assn., Central Connecticut Tool and Die Assn., and Eastern Massachusetts Tool and Die Assn.

• **EMPLOYMENT HIGH**—Employment in iron and steel plants during February reached a postwar peak of 626,200 wage earners and salaried workers, exceeding the previous figure of 625,200 established in August 1947, according to the American Iron and Steel Institute. The February total included 533,000 wage earners. In February 1947 total employment amounted to 606,700 of whom 517,500 workers were wage earners.

Steel Ingot Production by Districts and Per Cent of Capacity



ttsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
73.0*	85.5*	66.0	65.0	94.0*	61.5*	82.5	41.0	102.0	73.0	83.0	77.5	98.0	74.5*
80.0	85.0	67.0	77.0	95.0	78.5	85.0	70.0	102.0	73.0	55.0	77.5	98.0	79.0**



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Miners' Pension Success Has Steelworkers Saying "Me Too!"

lew York

• • John L. Lewis' successful pen-ion battle has made almost every vorker pension conscious. The 4 to decision of the National Labor elations Board that pensions are a ubject for collective bargaining, dds fuel to the security fire.

Steelworkers are negotiating now or a wage rate change—no other nange in the contract is permitted t this time. But when a new con-act comes up for consideration ext year much of the time will be pent on a new pension plan in the teel industry.

As a side issue in the current teel wage negotiation the success f the United Mine Workers will trengthen Phil Murray's hand. fter all, his union has lived up to ll of its obligations, there have een no slowdowns, there have been o threats of a strike and all has een sugar and honey.

Just how long "good" relations ould continue in the steel industry a resounding "no" were to given the wage demand in the face of he tactics used by John L. Lewis nd what they got him is not hard guess. The gains made by Mr. ewis and the preview of what he expected to ask for in a new con-act are disturbing to steel of-ials.

Steel union officials as well as teelworkers see no difference be-veen being a steelworker or a ineworker as long as both are on teel company payrolls. They are ready asking why one segment ets such good treatment because crash-bang bargaining tactics hile others get—so far—polite if, nds and Mary Anns. This will be artially answered within the next ew days that remain for the steel age negotiations.

Steel management has been put a bad light with its employees hrough no fault of its own. It had othing to do with the present pen-on settlement with John L. Lewis. has never had too much to say n a new coal contract. But it has ad to pay the freight after the racas was over.

Last year Ben Fairless, U. S. teel head, helped settle the coal trike. In doing so he saved the ndustry about 7 million tons of

Pension Issue Doesn't Enter Present Discussion But Aids Labor Voice

By TOM CAMPBELL
News-Markets Editor

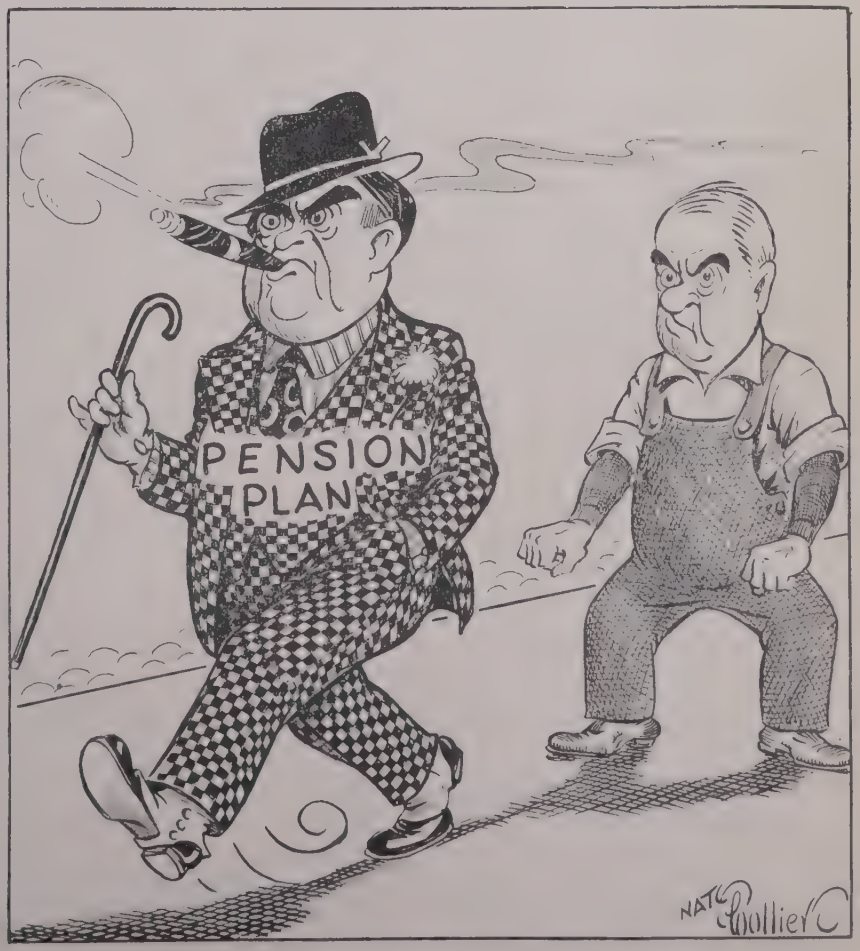
steel. The pattern used was no different than what had been given in other industries, yet he was severely criticized in some quarters. The criticism was unfounded in view of what he faced.

This year Mr. Fairless refused to become party to any meeting with John L. Lewis because he felt that the pension problem was one for the trustees. Subsequent events proved that Mr. Fairless was correct—but it is doubtful if he expected the steel industry to be saddled with the present "tentative" mine pension settlement.

But, since this has happened, steel leaders have to revise their previous ideas on steel wage bargaining—unless, of course, they want to throw down the drain all the goodwill that has been built up between the steelworkers union and them over the past many years. Some might want to do this but Ben Fairless is not one of them. Once again he is faced with a dilemma not of his own making.

Regardless of what happens at the steel wage negotiations the USWA will start early in 1949 getting pension demands ready now that the principle has been so poignantly put by the NLRB. It is true that the USWA does not qual-

Me Too!!



ify under the Taft-Hartly Bill because its officers have not filed the non-Communist oath. That does not change the far reaching decision of the NLRB however. Nor does it mean that the steel union would let an oath of any kind stand in its way of gaining the right to help frame pension plans for steelworkers.

Management everywhere has always felt strongly that pensions were its sole prerogative. It will be hard to sit down and bargain on pensions. For a great number of years steel brass has strictly controlled the payments and conditions of pensions. But since management asked for the Taft-Hartley Bill and got it they will have to go along with the pension ruling unless it is changed—and it probably won't be.

In the beginning pension plans of the noncontributary kind may be dropped or seriously altered in view of the NLRB ruling. If firms feel that it is their business to establish and run the plans they will also feel that they can ditch them if they want to. But this will mean also that unions will be hot on the trail to try to negotiate new plans with the best provisions that collective bargaining power can produce.

In recent years union leaders have been heading towards more social security in lieu of high wage rate concessions. The steelworkers have been one of the strongest unions to take that tack. While pensions may not be mentioned seriously in current hearings on steel wage negotiations their influence will be felt.

If Mr. Murray fails to get a moderate wage increas from steel this year it is realistic to assume that the steel industry will suffer a major and serious strike when the present contract runs out on May 1, 1949. There is little chance that the steelworkers union will go back on its no strike pledge. But after th honeymoon is over—that is anothe story.

It seems that the steel industry which is plagued with high costs obsolescence (and no money for re placement), government meddling public reaction to necessary pric increases and basic changes in mar keting and policies, is doomed t spend an important part of its tim and money on industrial relations

The time when steel leaders coul sit back and leave industrial rela tions to whims and guesses wen out the window a long time ago— even the most rambunctious ol timer in steel admits that now. I is a tough job for steel manage ment and has no easy or lasting so lution—except possibly a depressio which some leaders for a split sec ond hope for some times—but tha is only a momentary "escape" flas and by no means reflects the gen eral feeling among steel leaders.

AMERICAN IRON AND STEEL INSTITUTE
SHIPMENTS OF STEEL PRODUCTS
ALL GRADES INCLUDING ALLOY AND STAINLESS
(Net Tons)

FEBRUARY - 1948
Month

Steel Products	Number of companies	Items	Current Month: Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Current Month: Per cent of Total Shipments	Current Month: Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)	To Date This Year: Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	To Date This Year: Per cent of Total Shipments	To Date This Year: Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)	Whole Year 1947: Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Whole Year 1947: Per cent of Total Shipments	Whole Year 1947: Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)
Ingots, blooms, billets, tube rounds, sheet and tin bars, etc.	43	1	285,525	5.7	249,121	* 580,028	5.6	* 490,498	3,089,121	4.9	2,273,970
Structural shapes (heavy)	12	2	323,722	6.4	3,116	658,198	6.3	5,759	4,436,129	7.0	2,640
Steel piling	4	3	23,411	0.5	2	46,554	0.4	8	324,224	0.5	23
Plates (sheared and universal)	29	4	537,881	10.7	29,371	* 1,066,692	10.2	63,634	6,345,216	10.0	219,227
Skelp	6	5	11,702	0.2	30,320	24,009	0.2	75,758	160,989	0.3	384,004
Rails—Standard (over 60 lbs.)	4	6	152,049	3.0	717	324,334	3.1	2,513	2,207,146	3.5	991
—All other	5	7	19,851	0.4	178	48,464	0.5	367	211,900	0.3	329
Joint bars	7	8	11,190	0.2	3,633	21,913	0.2	5,564	173,923	0.3	15,198
Tie plates	7	9	36,988	0.7	171	77,360	0.7	171	504,779	0.8	4,437
Track spikes	7	10	11,190	0.2	24	21,735	0.2	24	163,746	0.3	146
Hot Rolled Bars—Carbon	33	11	518,330	10.3	47,847	* 1,039,349	10.0	106,925	6,242,416	9.9	745,770
—Reinforcing—New billet	16	12	106,724	2.1	679	212,564	2.0	1,269	1,277,075	2.0	9,775
—Rerolled	12	13	10,156	0.2	-	20,132	0.2	-	175,833	0.3	-
—Alloy	24	14	145,831	2.9	15,030	304,069	2.9	30,631	1,741,432	2.7	212,382
—Total	42	15	781,041	15.5	63,556	* 1,576,114	15.1	138,825	9,436,756	14.9	967,927
Cold Finished Bars—Carbon	27	16	110,399	2.2	485	226,388	2.2	751	1,426,701	2.3	9,249
—Alloy	25	17	14,824	0.3	278	* 31,934	0.3	585	218,802	0.3	2,601
—Total	35	18	125,223	2.5	763	* 258,322	2.5	1,336	1,645,503	2.6	11,850
Tool steel bars	18	19	6,272	0.1	83	12,921	0.1	174	87,279	0.1	1,670
Pipe & Tubes—Butt weld	16	20	157,806	3.1	1,732	316,605	3.0	3,844	1,892,691	3.0	78,080
—Lap weld	8	21	29,942	0.6	-	60,827	0.6	-	389,762	0.6	875
—Electric weld	12	22	110,358	2.2	352	243,555	2.3	672	1,254,325	2.0	4,274
—Seamless	16	23	220,450	4.4	14,108	* 438,679	4.2	27,086	2,581,106	4.1	157,208
Wire rods	19	24	50,509	1.0	22,260	* 112,618	1.1	* 49,838	667,282	1.1	331,192
Wire—Drawn	39	25	213,329	4.2	14,773	442,311	4.2	30,173	2,590,963	4.1	181,783
—Nails and staples	17	26	68,775	1.4	1,278	137,729	1.3	2,651	799,436	1.3	8,481
—Barbed and twisted	14	27	22,641	0.4	26	45,219	0.4	28	256,991	0.4	128
—Woven wire fence	12	28	31,071	0.6	265	65,716	0.6	447	407,295	0.6	3,616
—Bale ties	11	29	9,655	0.2	-	19,824	0.2	-	119,917	0.2	-
Black Plate—Ordinary	9	30	61,256	1.2	512	123,879	1.2	512	801,745	1.3	2,033
—Chemically treated	1	31	680	-	-	1,165	-	-	19,252	-	-
Tin and Terne Plate—Hot dipped	8	32	127,295	2.5	57	266,082	2.5	72	2,093,149	3.3	228
—Electrolytic	9	33	120,140	2.4	191	248,668	2.4	215	1,617,659	2.6	529
Sheets—Hot rolled	32	34	583,379	11.6	58,511	* 1,263,067	12.1	112,615	7,891,798	12.5	578,426
—Cold rolled	16	35	490,633	9.7	1,976	1,052,216	10.2	4,460	5,504,578	8.7	28,498
—Galvanized	16	36	123,683	2.5	421	* 256,513	2.5	537	1,609,881	2.5	889
Strip—Hot rolled	22	37	135,960	2.7	27,351	* 282,058	2.7	57,494	1,740,085	2.7	308,655
—Cold rolled	33	38	127,192	2.5	1,169	273,510	2.6	3,760	1,613,005	2.6	28,030
Wheels (car, rolled steel)	5	39	22,418	0.4	23	48,544	0.5	216	356,873	0.6	2
Axles	5	40	12,898	0.3	9	28,333	0.3	68	185,019	0.3	53
All other	-	41	-	-	-	-	-	-	-	-	-
TOTAL STEEL PRODUCTS	140	42	5,046,115	100.0	526,069	*10,453,762	100.0	* 1,079,319	63,179,523	100.0	5,595,392

During 1946 the companies included above represented 99.5% of the total output of finished rolled steel products as reported to the American Iron and Steel Institute.

* Adjusted.

Conversion Deals Are Booming Electric Furnace Steelmaking

Pittsburgh

• • • **Conversion deals** are a prime reason why electric furnace ingot production for the first 2 months of 1948 was 29 pct higher than the corresponding 1947 period. Compared with strike-affected 1946, when production of electric furnace steel for both ingots and castings averaged only 47 pct of capacity, the gain is even more startling. For 1947 this figure was 73.7 pct of rated capacity; in March 1948, the latest month for which the American Iron & Steel Institute statistics are available, the electric furnace operating rate climbed to 89 pct.

One thing is certain: Only a small percentage of this remarkable rise is due to increased alloy business. However, alloy sales have turned stronger in the past few months. Electric furnace alloy steel deliveries which were on a 3 to 4 week basis in January are now extended to about 6 to 7 weeks.

But the alloy steel salesmen are still looking for new business. As far as melting capacity goes they could take on a big aircraft alloy program without batting an eyelash but there would be some schedule changes on bar mills. Present bona fide alloy users would probably be unaffected. Those who are buying electric furnace alloys because they are easier to get than openhearth steels will probably take some cuts. Bar users in general will be vulnerable if ERP calls for a lot of bars and if a good sized aircraft program is started: The automobile industry is the nation's No. 1 bar consumer.

Trade sources report great strides in the conversion deal during the past year. There are figures to back them up. Electric furnace alloy ingot production has been averaging 4000 tons a month better this year than the 1947 average, 15,000 tons better than the 1946 average. Against this, total electric furnace ingot production is running 48,000 tons a month above the 1947 average, 59,000 tons a month over the 1946 average.

The accompanying table shows the gains electric furnace ingot output has been making in comparison with total ingot production. Other American Iron & Steel Institute figures show that while electric furnace alloy steel accounted for

Alloy Steel Sales Rise Plays Minor Role in Revival of War-Built Furnaces

o o o

By GEORGE F. SULLIVAN
Pittsburgh Regional Editor

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For previous data on trends in alloy steel production see THE IRON AGE, Oct. 2, 1947, p. 119.

72 pct of total electric furnace production in the period 1936-1942 this percentage fell to 62 pct in 1946. In 1947 alloys accounted for only 47 pct of total electric furnace steel production. In the first 2 months of 1948 this figure was down to 42 pct.

Not all of this new spread between electric furnace carbon and alloy steel is in production of carbon steel ingots for conversion by other producers into scarce flat-rolled products. Some is accounted for by production of rimming steel and other higher quality carbon steels in electric furnaces. But as a counter to this it is known that in some cases alloy steels are being specified where they are not needed, merely to get better delivery. Most alloy producers insist they are doing their best to weed out this type of business on the grounds that it will not stick when carbon steel supply eases.

Four Students Receive Foundry Scholarships

Evanston, Ill.

• • • **Four students** in the Northwestern University Technological Institute have received scholarships from the Foundry Educational Foundation of Cleveland. The awards were announced at an all-day conference at the Institute attended by high school vocational counselors, principals, and members of the foundation.

The scholarship winners, studying in a new curriculum for the training of supervisory engineers in the foundry industry, are: Maurice F. Dunn, Jr., Winnetka, Ill.; Vincent R. Howard and Arthur Rutenberg of Chicago and Harold A. Roman of Moline, Ill.

According to Burgess H. Jennings, chairman of the mechanical engineering department of the university, there exists a critical shortage of trained personnel in foundry work and the industry can absorb a large number of graduates each year to serve as supervisory engineers.

Trends in Electric Furnace Steel Production

Net Tons—000 Omitted

Source—American Iron & Steel Institute. Compilation—The Iron Age

	Electric Furnace Ingot Output	Open-hearth Ingot Output	Total Ingot Output	Percent Electric Furnace to Total	Shipments Semi-finished† Steel for Further Conversion	Percent SF Steel for Conversion to Total Ingot Output
1947						
January	275	6,528	6,803	4.2	182	2.68
February	268	5,818	6,086	4.6	141	2.31
March	305	6,599	6,904	4.6	201	2.91
April	297	6,344	6,641	4.7	179	2.70
May	313	6,619	6,932	4.7	211	3.04
June	297	6,298	6,595	4.7	209	3.17
July	276	6,016	6,292	4.6	142	2.26
August	303	6,308	6,611	4.8	152	2.30
September	298	6,133	6,431	4.9	154	2.39
October	341	6,810	7,151	5.0	230	3.22
November	328	6,525	6,853	5.0	211	3.08
December	335	6,635	6,970	5.0	237	3.4
Total 1947	3,636	76,633	80,269*	4.7	2,249	2.8
1948						
January	355	6,753	7,108	5.3	239	3.36
February	347	6,230	6,577	5.6	249	3.79

* Does not include bessemer steel output. † Includes all semifinished steel.

Industrial Briefs . . .

• ACQUSITION — Lindberg Engineering Co., Chicago, has acquired the assets of the Electronics Div. of Illinois Tool Works, Chicago, and will continue the business of the manufacture and sale of high frequency induction and dielectric heating equipment.

• DISTRICT OFFICE — Cold Metal Products Co., Youngstown, producers of cold-rolled carbon, alloy, spring and stainless steel strip, has opened a new district office in the Illinois Bldg., Indianapolis.

• NEW NAME — Announcement has been made that the corporate name of Dulien Steel Products of New York has been changed to Fabrikant Steel Products, Inc. No change in ownership, management or personnel.

• SHIFTS HEADQUARTERS —Headquarters for American Cladmetals Co. has been established at its plant in Carnegie, Pa. Extensive construction work now underway at the company's plant necessitated the shifting of its offices from Pittsburgh.

• REBUILDING—The Buffalo Structural Steel Corp. will spend $500,000 to rebuild and expand its plant and steel fabricating facilities which were partially destroyed by fire Jan. 26.

• DIECASTING FIRM—B & T Engineering & Sales Co., Detroit, has been organized by Louis W. Blauman and E. Martin Tallberg for the purpose of building diecasting machines and furnishing engineering and consulting services to the industry.

• SELLS CASTING PLANT —A malleable iron castings plant at Ashtabula, Ohio, has been sold by WAA to the wartime operator, Lake City Malleable, Inc., for $1.6 million.

• SALES DISTRIBUTOR—Moore Handley Hardware Co., Inc., 27 S. 20th St., Birmingham, has been appointed sales distributor in Alabama for the Landis Tool Co., Waynesboro, Pa.

• PURCHASES PLANT—Wyman-Gordon Co., Harvey, Ill., has purchased the adjacent wartime facilities to be used by Ingalls-Shepard Co., their affiliate. Ingalls-Shepard is a manufacturer of traveling cranes.

• EXPANDING—Sam Tour & Co., Inc., New York, engineers, metallurgists and consultants, are expanding their laboratories and workshops to better handle the increase in the volume of its business.

• CHANGES ADDRESS — Seamless Steel Tube Institute has announced the removal of its offices to 1901 Oliver Bldg., Pittsburgh 22.

• NEW DIVISION—American Car & Foundry Co. has announced that a new division to be known as Tool and Die Control has been established with H. C. Amble in charge. His headquarters will be at their Berwick plant.

• WESTERN OUTLET—Sterling Tool Products Co., Chicago, manufacturer of portable electric and air driven sanding machines, has established a new sales office and factory owned and operated service depot at 405 W. Washington St., Los Angeles.

• $23 MILLION ORDER — Bethlehem Steel Co. has booked an order for four super-tankers for the Texas Co. at an estimated cost of between $23 million and $25 million. The vessels will be built at the Quincy yard and delivery of the first one is scheduled for the summer of 1949.

Construction Steel . . .

• • • **Fabricated steel awards** this week included the following:

950 Tons, Los Angeles, Los Angeles Examiner press room building, to Bethlehem Pacific Coast Steel Corp., San Francisco.

500 Tons, Baltimore, three bridges for Pennsylvania R.R., to Bethlehem Steel Co., Bethlehem.

400 Tons, Philadelphia, Gulf Refining Co. warehouse, through Turner Construction Co., Philadelphia, to Bethlehem Steel Co., Bethlehem.

370 Tons, Norristown, Pa., boiler plant extension for Norristown State Hospital, to Bethlehem Steel Co., Bethlehem.

300 Tons, Tampa, Fla., dock shed for Waterman Steamship Corp., Mobile, to Southern Steel Works Co., Birmingham.

110 Tons, Hunts Point power house, compressor house extension, Consolidated Edison Co. of New York Inc., to Grand Iron Works, Inc., New York.

60 Tons, Hunts Point power house, freight elevator and conveyor, Consolidated Edison Co. of New York Inc., to Grand Iron Works, Inc., New York.

• • • **Fabricated steel inquiries** this week included the following:

10,220 Tons, Kingman, Ariz., transmission towers for U.S. Bureau of Reclamation specification 2165. Bids close Apr. 29.

7600 Tons, New York City, Metropolitan Life Insurance Office building.

4000 Tons, Des Moines, Iowa, state office building. Bids close May 25.

1960 Tons, Augusta, Maine, Kennebec River bridge.

1500 Tons, Philadelphia, Reading R.R. bridge over Vine St., Apr. 30.

1400 Tons, Devon, Conn., power house for Connecticut Light & Power Co., through United Engineers & Constructors, Philadelphia.

635 Tons, Sacramento, Calif., superstructure under tracks of Southern Pacific R.R. on 12th St., California Div. of iHghways, Sacramento, bids to May 12.

600 Tons, Philadelphia, Asten Hill Mfg. Co., through the Ballinger Co., Philadelphia, Apr. 27.

550 Tons, Pocotello, Iowa, phosphorus plant for Westvaco Chlorine Products Corp., through United Engineers & Constructors, Philadelphia.

310 Tons, Chicago, Cook County district school No. 220.

300 Tons, New Jersey, bridge on route 4, section 4B, New Jersey Dept. of Highways, Apr. 29.

280 Tons, Iowa City, Iowa, Benston, Street bridge.

220 Tons, Hall County, Neb., bridge S58-3-1, State of Nebraska.

120 Tons, Philadelphia, St. Ann's Church.

105 Tons, Petaluma, Calif., bridge across Petaluma Creek, City Clerk, bids to May 3.

100 Tons, Gloucester, Mass., bridges.

• • • **Reinforcing bar awards** this week included the following:

8500 Tons, Coram, Mont., Hungry Horse Dam. through U.S. Engineers. General Construction Co., Seattle, and ten others are low bidders for the entire contract.

500 Tons, Spokane, grain elevators in eastern Washington, through Central Construction Co. to Northwest Steel Rolling Mills, Seattle.

425 Tons, Philadelphia, Brown Instrument Co., through United Engineers & Constructors, Philadelphia, to Bethlehem Steel Co., Bethlehem.

315 Tons, Peoria, Ill., grandstand exhibition park to V. Dobst Contracting Co., Peoria, Ill.

300 Tons, Seattle, Unit H, medical-dental building, University of Washington, through J. C. Boespflug Construction Co. to Northwest Steel Rolling Mills, Seattle.

300 Tons, Philadelphia, Rhawnhurst Elementary School, City of Philadelphia through McCloskey & Co., Philadelphia, to Bethlehem Steel Co., Bethlehem.

(CONTINUED ON PAGE 124)

Congress Does Not Think Steel Allocations Are Inevitable

ashington

• • **While government allocation** steel output continues as a pos-ibility, it is by no means inevita-e. Despite the high-pressure uns-or-butter" campaign for re-mament and increased govern-ental authority now being con-ucted by the White House, a ma-rity of Congress remains uncon-nced that the nation's economy is oing to pot within the next year less industrial output is regi-ented by federal decree.

Majority leaders on Capitol Hill alize that the Administration's ntrol-psychosis is increasing eekly and is designed to reach a ak shortly before the November ections. At that time, President ruman may recall the Congress to t on an "emergency" request for

This story reflects Congressional re-tion to possible steel allocations later the year. Other viewpoints were re-rted in THE IRON AGE, Apr. 1, . 119 and 124.—Ed.

ge defense expenditures, alloca-on controls, and the now-familiar arning about not changing horses. But Congress is also from Mis-uri. It has to be shown. Within e past 6 months, Mr. Truman re-eatedly has endorsed his advisors' gings for Congress to reimpose artime controls over steel output. ach time, Congress has shied way from the prospect of a return such emergency measures.

A certain segment of steel lead-rship would welcome a return to eel rationing for the obvious rea-on that such a move would take e industry off the spot as far as cking consumers is concerned. st as no mother ever relished the sk of dividing 10 cookies among 2 hungry children, no businessman ants the thankless job of being rced to drop steel-hungry cus-mers.

Yet Mr. Truman favors this urse for reasons of political ex-diency ("something for every-ody"); some steel consumers fa-r it because they fondly assume ey would get a whole cookie in-ead of a part, and some producers vor it because they would then be le to pass the ball of rationing sponsibility to Washington.

Majority Leaders Must See Need for Controls If They Take Action

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By GEORGE BAKER
Washington Bureau

○ ○ ○

One prominent Republican leader in the House puts it this way: "The White House is trying to create the hysterical impression that domestic consumption of steel, plus national defense needs, plus foreign aid all point inevitably to allocation controls.

"Actually, exports under the Marshall Plan will be only slightly more than the $11 billion worth of 1947 exports. ERP is the same old relief under a new label. As far as rearmament is concerned, a peacetime munitions program could be assimilated by the steel industry with far fewer headaches than we had in the forced-draft production years of 1943 and 1944.

"Mr. Truman underestimated this country when he said we must choose between guns and butter. The productive capacity of this nation is so tremendous that we can have both if we decide we want both."

At present, Mr. Truman hasn't a hope that the current session of Congress will between now and the June adjournment grant him the allocation controls so dear to the hearts of his advisors. He is banking on late summer or early fall as the most propitious time for playing his ace in the hole—the argument that nothing short of another 4 years of a controlled economy can save the nation from tottering over the brink.

After the November elections—assuming the present tide continues and the voters pick a Republican President and House and possibly a Republican Senate—it will take a major national emergency to get control legislation on the statute books.

That is why Mr. Truman's departmental advisors are basing their strategy on the theory that the present Congress may be stampeded into control-mindedness on the eve of the elections.

But so far, controls aren't in the legislative cards for 1948—unless Mr. Truman can prove to Congress that industry is incapable of bearing the largest peacetime production burden in history.

Coming Events

Apr. 26-28 **American Supply & Machinery Manufacturers Assn., National Supply & Machinery Distributors Assn., Southern Supply & Machinery Distributors Assn., Triple Mill Supply convention,** Atlantic City.

Apr. 26-30 **American Management Assn.,** packaging exposition and conference, Cleveland.

May 3-7 **American Foundrymen's Assn.,** convention and show, Philadelphia.

May 11-12 **American Steel Warehouse Assn.,** annual meeting, Chicago.

May 13-14 **American Management Assn.,** production conference, Chicago.

May 15-22 **International Petroleum Exposition,** Tulsa, Okla.

May 26-27 **American Iron & Steel Institute,** meeting, New York (restricted to members only).

May 27-29 **Society for Experimental Stress Analysis,** meeting, Pittsburgh.

June 6-9 **American Gear Manufacturers Assn.,** annual meeting, Hot Springs, Va.

June 10-12 **National Steam Specialty Club,** annual meeting, Hot Springs, Va.

June 21-25 **American Society for Testing Materials,** annual meeting, Detroit.

Construction Steel

(CONTINUED FROM PAGE 122)

295 Tons, Whiting, Ind., engineering building for Standard Oil to Ceco Steel Products Co.

285 Tons, Pine Grove, Pa., Pine Grove Dam, Chester Municipal Water Authority to George M. Brewster, Bogota, N. J.

225 Tons, Lancaster, Pa., RCA tube plant, through John McShain, Inc., Philadelphia, to Bethlehem Steel Co., Bethlehem.

225 Tons, Seattle, art school, University of Washington, through Henrick Valle Co. to Northwest Steel Rolling Mills, Seattle.

115 Tons, Seattle, permanent state highway 15, through N. Fiorito Co. to Northwest Steel Rolling Mills, Seattle.

100 Tons, Cottonwood, Ida., St. Gertrude Convent, through Gus J. Bouten Co. to Northwest Steel Rolling Mills., Seattle.

100 Tons, Seattle, utility tunnel, University of Washington, through M. T. Munter, to Northwest Steel Rolling Mills, Seattle.

100 Tons, Gloucester, Mass., four bridges to Truscon Steel Co., Boston.

• • • **Reinforcing bar** inquiries this week included the following:

1270 Tons, Tracy, Calif., construction on Delta-Mendota Canal, Bureau of Reclamation, Antioch, Calif., Spec. 2197, bids to May 18.

225 Tons, Lynnfield and Wakefield, Mass.,

170 Tons, Philadelphia, Racquet Club garage.

165 Tons, Sacramento, superstructure under tracks of Southern Pacific R.R. on 12th St., California Div. of Highways, Sacramento, bids to May 12.

150 Tons, Philadelphia, Gulf Oil Co. refinery storehouse, through Turner Construction Co., Philadelphia.

150 Tons, Norristown, Pa., boiler house for Norristown State Hospital, Wark & Co., Philadelphia, low bidders.

• • • **Plate awards** this week included the following:

380 Tons, Chicago, two boats for central barge line, placed with Calumet Shipyard & Drydock Co., South Chicago.

Steel Case Progressing

Washington

• • • **In expectation** of a favoral decision by the trial examiner co cerning the admissibility as ev dence of certain types of data, Fe eral Trade Commission attorne are confident that they can wind t the formal hearings in the prese case against the steel industry wit in 30 days after the ruling, d May 4.

Substantially all requested pri ing data is now in its hands a FTC counsel has begun its job analyzing it to support its charg of collusion and conspiracy.

AMERICAN IRON AND STEEL INSTITUTE

Production of Open Hearth, Bessemer and Electric Steel Ingots and Steel for Castings

YEAR 1948

(Preliminary)

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly production (Net tons)	Number of week in mont
	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity		
January	6,768,497	95.5	343,169	77.5	361,110	79.0	7,472,776	93.6	1,686,857	4.43
* February	6,245,344	94.3	340,596	82.3	354,270	82.9	6,940,210	93.0	1,676,379	4.14
† March	6,842,289	96.6	363,235	82.0	407,100	89.0	7,612,624	95.3	1,718,425	4.43
† *1st Quarter*	*19,856,130*	*95.5*	*1,047,000*	*80.6*	*1,122,480*	*83.6*	*22,025,610*	*94.0*	*1,694,278*	*13.00*
April										4.29

YEAR 1947

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated weekly production (Net tons)	Number of week in mont
	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity	Net tons	Percent of capacity		
January	6,544,841	95.1	384,096	87.7	284,309	65.9	7,213,246	93.0	1,628,272	4.43
February	5,830,371	93.8	314,912	79.6	276,779	71.1	6,422,062	91.7	1,605,515	4.00
March	6,614,369	96.1	378,893	86.5	314,224	72.9	7,307,486	94.3	1,649,545	4.43
1st Quarter	*18,989,581*	*95.0*	*1,077,901*	*84.8*	*875,312*	*69.9*	*20,942,794*	*93.1*	*1,628,522*	*12.86*
April	6,360,600	95.4	375,675	88.6	306,422	73.4	7,042,697	93.8	1,641,654	4.29
May	6,634,716	96.4	372,878	85.2	321,903	74.6	7,329,497	94.5	1,654,514	4.43
June	6,312,674	94.7	351,247	82.8	304,744	73.0	6,968,665	92.8	1,624,397	4.29
2nd Quarter	*19,307,990*	*95.5*	*1,099,800*	*85.5*	*933,069*	*73.7*	*21,340,859*	*93.7*	*1,640,343*	*13.01*
1st 6 Months	*38,297,571*	*95.3*	*2,177,701*	*85.2*	*1,808,381*	*71.8*	*42,283,653*	*93.4*	*1,634,467*	*25.87*
July	6,028,707	87.8	256,125	58.6	285,322	66.3	6,570,154	84.9	1,486,460	4.42
August	6,324,456	91.9	346,033	79.0	311,597	72.2	6,982,086	90.1	1,576,092	4.43
September	6,147,448	92.4	334,425	79.0	306,769	73.6	6,788,642	90.6	1,586,131	4.28
3rd Quarter	*18,500,611*	*90.7*	*936,583*	*72.2*	*903,688*	*70.7*	*20,340,882*	*88.5*	*1,549,191*	*13.13*
9 Months	*56,798,182*	*93.7*	*3,114,284*	*80.8*	*2,712,069*	*71.4*	*62,624,535*	*91.8*	*1,605,757*	*39.00*
October	6,826,543	99.2	384,272	87.8	349,520	81.0	7,560,335	97.5	1,706,622	4.43
November	6,538,179	98.1	360,620	85.0	334,236	80.0	7,233,035	96.3	1,686,022	4.29
December	6,649,666	96.8	373,367	85.5	343,043	79.7	7,366,076	95.2	1,666,533	4.42
4th Quarter	*20,014,388*	*98.0*	*1,118,259*	*86.1*	*1,026,799*	*80.3*	*22,159,446*	*96.4*	*1,686,411*	*13.14*
2nd 6 months	*38,514,999*	*94.4*	*2,054,842*	*79.1*	*1,930,487*	*75.5*	*42,500,328*	*92.5*	*1,617,827*	*26.27*
Total	76,812,570	94.8	4,232,543	82.1	3,738,868	73.7	84,783,981	92.9	1,626,083	52.14

Note—The percentages of capacity operated are calculated on weekly capacities of 1,553,721 net tons open hearth, 98,849 net tons Bessemer and 97,358 net tons electric ingots and steel for castings, total 1,749,928 net tons; based on annual capacities as of January 1, 1947 as follows: Open hearth 81,010,990 net tons, Bessemer 5,154,000 net tons, Electric 5,076,240 net tons, total 91,241,230 net tons.

Weekly Gallup Polls . . .

Voters Support Both Military Training and Draft

Princeton, N. J.

• • • **Voter sentiment** throughout the nation strongly supports President Truman's urgent plea for both Universal Military Training legislation and a return to the draft in order to strengthen the nation's armed forces, according to George Gallup, director, American Institute of Public Opinion.

Thousands of representative citizens were asked the following question in regard to U.M.T.:

"Do you think Congress should or should not pass a law to require every ablebodied young man (who has not already been in the armed forces) to take military or naval training for 1 year?"

The same question has been asked over a period of years. The following table shows today's sentiment compared with the trend.

	Favor Pct	Oppose Pct	No opin. Pct
Dec. 1942	66	27	7
Nov. 1943	63	29	8
Dec. 1944	70	25	5
Nov. 1945	75	21	4
July 1947	75	18	7
Jan. 1948	65	24	11
Today	77	16	7

Sentiment on the return to Selective Service was tested by this question:

"Do you think Congress should pass a law which would permit the government to draft young men to serve in the armed forces?"

The national answers:

	Pct
Approve law	63
Qualified approval	7
Disapprove law	23
No opinion	7

•

• • • **Comparatively few** voters in the United States have made up their minds as to whether such candidates as Harold E. Stassen, Arthur H. Vandenberg, Joseph E. Martin, and Robert A. Taft are conservatives or liberals,—terms which, of course, mean different things to different people.

"Do you consider the following men to be liberal or conservative in their political views?"

The list follows:

	Lib. Pct	Cons. Pct	No opin. Pct
Henry Wallace	41	5	54
Harry Truman	36	25	39
Geo. Marshall	30	22	48
Harold Stassen	21	19	60
A. Vandenberg	20	26	54
Douglas MacArthur	16	38	46
Thomas Dewey	15	37	48
Earl Warren	13	14	73
Robert Taft	9	40	51
Joseph Martin	8	22	70
L. Saltonstall	6	12	82
Harry Byrd	5	18	77

Conservative - Liberal Tags In Politics Seen Having Little Meaning to Voters

o o o

Perhaps the outstanding thing about the above vote is the large percentage of people who, in most cases, are undecided. The names liberal and conservative are terms which apparently have comparatively little meaning to the great bulk of the American voting population.

50 YEARS AGO

THE IRON AGE, *April 21, 1898*

• "Those who are trying to find money in New York or England to float new railway enterprises, can find some melancholy comfort in the recent enormous oversubscription to the shares of St. Thomas Lipton's tea company. All that is necessary is to make your propopsition attractive enough and it also might be worth while for some gentlemen to give up railroads and try tea."

• **"The New Jersey Aluminum Co., Newark, N. J., recently built the top of a delivery wagon for a local tradesman of aluminum. All parts, including sides, back, dash rails and hand rails, were made of this metal. The top is said to be light and serviceable."**

• "An extraordinary accident is reported from Austria. Some large warehouses were destroyed at Fiume lately by what was believed to be lightning. In cleaning the debris, it was discovered that the fire was caused by a great meteoric stone found in the ruins which weighed about 4 tons."

• **"One of the largest type traveling cranes ever built has just been completed by the Brown Hoisting & Conveying Machine Co. of Cleveland. It is 347 ft long and reaches a height of 90 ft. When run to full capacity, it will carry a 5-ton load 30 mph and when operated under ordinary conditions it will do the work of 50 men."**

• "The crack North German Lloyd steamer "Kaiser Wilhelm der Grosse" again lowered the record between Southampton and New York, after a run of 5 days and 20 hr with an average speed of 22.29 knots per hr."

• **"It is currently reported that if the four ships which a Philadelphia yard is to build for Russia prove satisfactory, a much larger order will follow."**

MACHINE TOOLS

. . . News and Market Activities

First Quarter Domestic Sales Show 25 Pct Gain Over Year Ago

• • • **First quarter** sales of machine tools to domestic customers registered about a 25 pct gain over the corresponding quarter of 1947, according to qualified sources in the industry.

Foreign sales during the same period dropped sharply, and some producers report they have not received a new foreign order for the past 60 days. The slack in foreign business is generally laid on the doorstep of the European Recovery Program, which was pending during the first quarter. ERP countries cagily refused to spend money of their own for machine tools until the fate of ERP was known and how much equipment they are going to get under the plan, which at this time would seem to be about $122 million.

Domestic sales in April have been below March levels in some sectors, although equipment particularly adapted to jet engine production has been moving at a rapid rate. Mass production of turbine blades will probably prove a very fertile field for some machine tool builders, particularly one of the big companies in the east, which apparently anticipated the present turn of events with considerable foresight.

Indications are that some of the government programs are going to come along at a time when domestic business will need bolstering.

Buyers attending the sale at Aviation Corp. of America, Toledo, last week, saw some very stiff prices paid for equipment. Much of the equipment offered was only 3 or 4 years old, and the bidding on some items was tough. A Pratt & Whitney jig machine, according to reports, brought the new sale price.

In Detroit the machine tool market is quiet to moderately active, save for perisstent rumors that extensive tooling programs for the armed forces are being considered. Up to the present time, however, there are no indications that such programs have progressed much beyond the stage of preliminary negotiation and requests for quotations.

Pending ERP Seen Cause Of Sharp Drop In Foreign Sales During Period

o o o

While the continuing interest in machine tools is reflected in numerous requests for quotations, important segments of the industry indicate that the number of orders being placed is slowing down. Meanwhile, a return to intensively competitive buying is indicated by some sources. One cause for optimism in the present situation is the continuing interest of small tool shops in substantial machine tool programs. In some cases it is reported that the dollar volume of such orders is in the $20,000 to $30,000 range, a sizable commitment for a small shop.

Placements in the Reo tooling program continue to come in. There are no other large programs on the horizon at the moment. The extensive engine program planned by Kaiser-Frazer at Willow Run has been shelved indefinitely, it is reported, although some K-F plant modernization is proceeding. A small plant improvement program at Buick is reported. Recent announcement of GM's plans to equip a plant at Lansing to produce the Kettering high compression engine may produce a considerable volume of new business in the months ahead, it is believed.

In the East, trade sources report that the first 2 months of this year business was fairly good, but in March it gradually tapered off and so far in April it is only spotty at best. The trade has not been excited about war talk coming out of Washington. It is far more interested in prospects of doing business with Europe when the Marshall Plan begins to function. Common opinion seems to be that there is a lot of business to get in Europe if only the recovery plan works. Current demand is running very largely to grinding equipment, presumably because government surplus supply of desirable tools has been depleted. Radial drills and milling machines sold quite well in January and February.

In Washington, War Assets Administration announced last week that nearly all remaining war-surplus machinery and industrial equipment formerly offered for sale at fixed prices now will be offered on a competitive bid basis.

The equipment, which cost the government an estimated $350 million, will first be screened by the Joint Army and Navy Machine Tool Committee for items required for military installations and the national stockpile. Fixed prices will remain in effect on a few items which still are in short supply or are included on national or regional set-aside lists for sale to veterans only. Following screening by JANMAT, the equipment will be offered on a competitive bid basis as individual items with provision for a 30-day inspection period. Any residue from the first sale will be lotted with other residual machinery and industrial equipment and sold on a tonnage basis.

During initial offerings, priority rights will be recognized on individual items. Unsold items then will be disposed of in lots to all classes of buyers.

Equipment selected by JANMAT and later released to industrial users on request will bear a new price schedule. If equipment is not purchased at the new prices, it will be returned to the national stockpile.

The new price schedule is as follows:

N-1 (condition) 90 pct of acquisition cost.

N-2 85 pct of acquisition cost.

N-3 and/or O-1 80 pct of acquisition cost.

O-2 70 pct of acquisition cost.

O-3 60 pct of acquisition cost.

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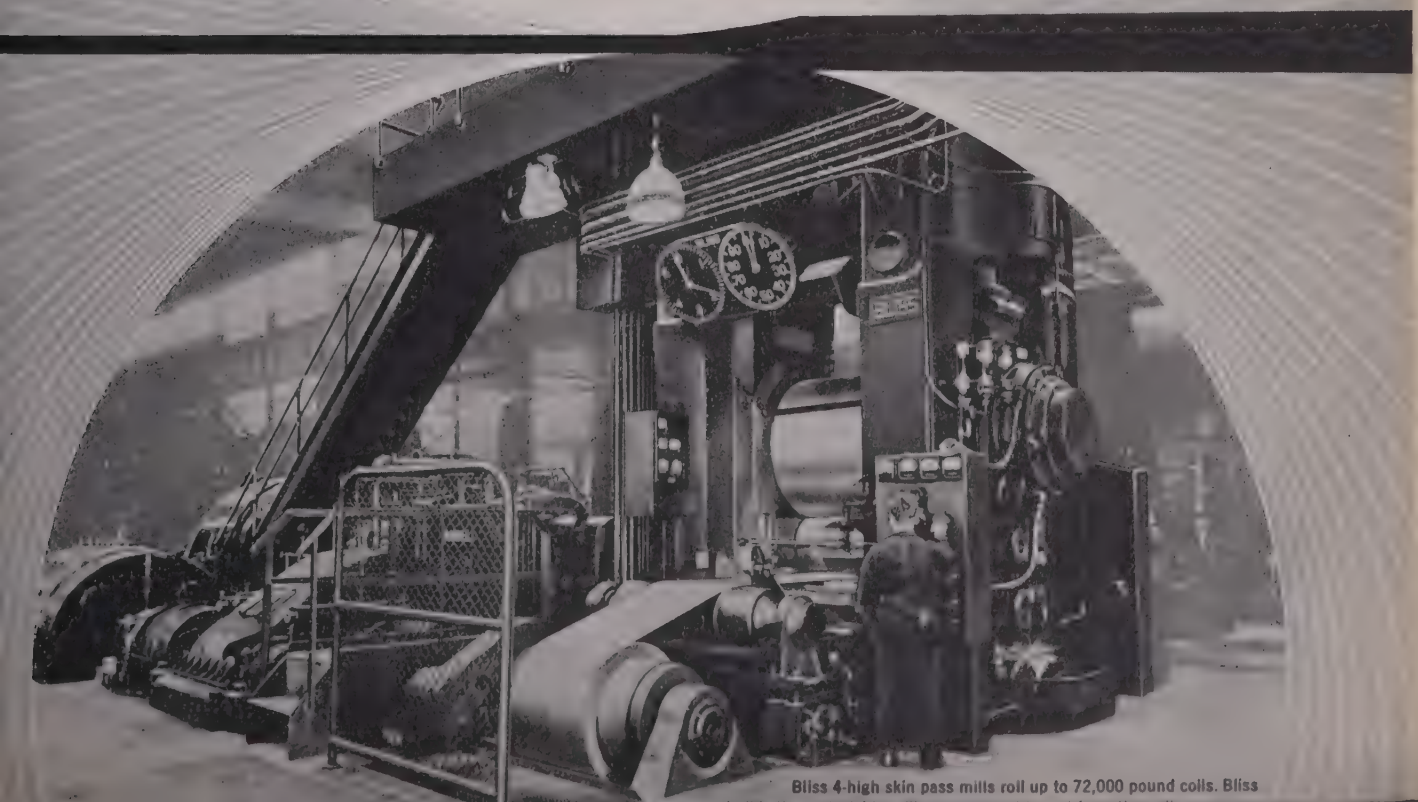

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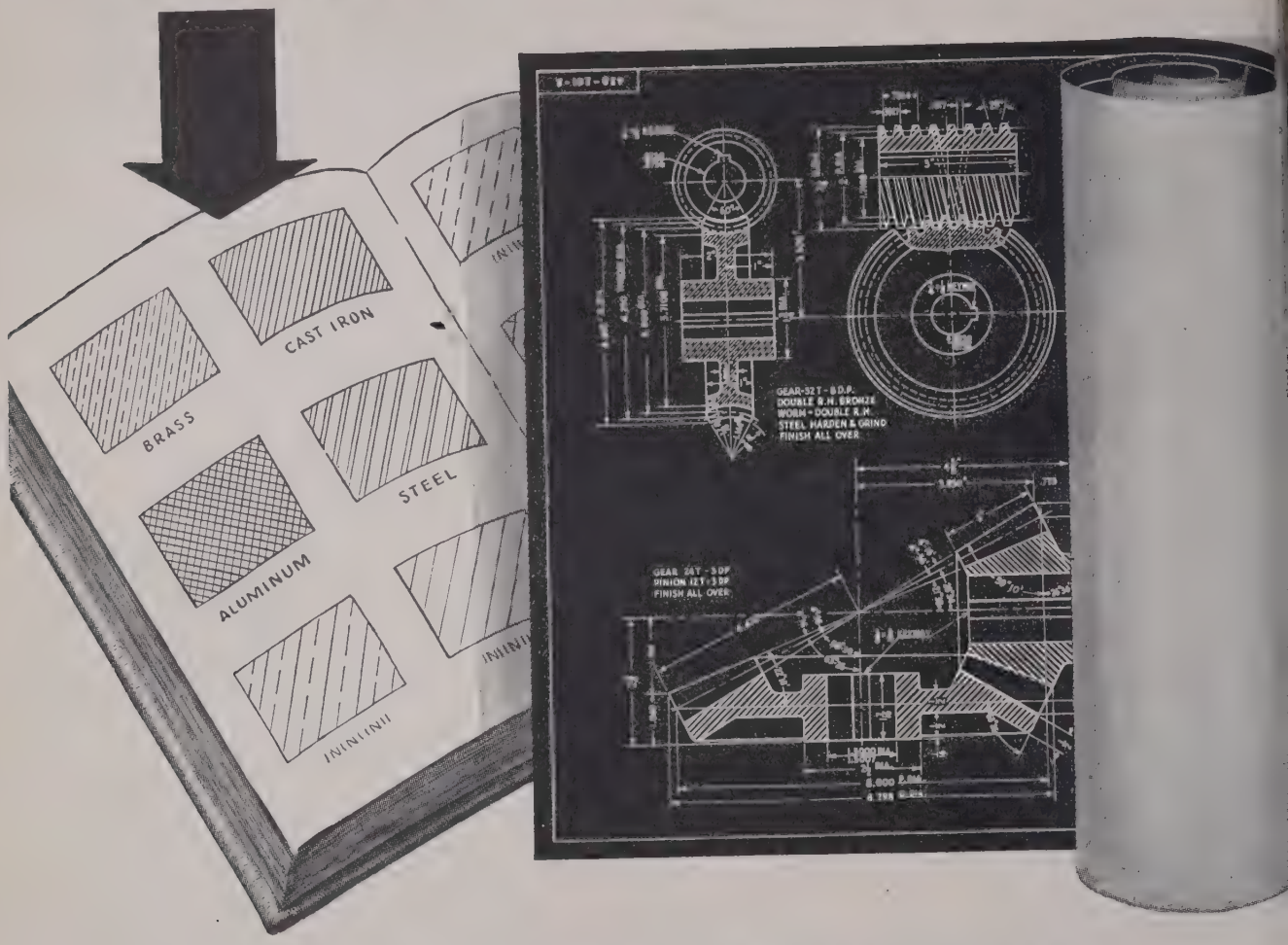

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Market Remains Active and Firm

• • Price stability and good activ- continued for another week. The g mills continue to want and to ke all the steelmaking material ey can get and last week, at least, od waters and the tail end of the eight car cutback were the most rious deterrents to movements.

Some district buyers were offer- g higher springboards for out of strict material. This competitive gle stiffened the market, but was t being pressed to the point of reatening the literal formula.

Foundries are expected to bounce ck to prestrike operational levels irly rapidly. Most are going right ead and using what coke they ill have on hand, figuring and ping that new supplies will be rthcoming shortly. And since ost of the foundries are near eir supply, little holdup is ex- pected.

Chemical borings have shown rength lately, especially in the ast, as foundries have been re- rning them to the cupola in place some cast items. It has been re- rted worthwhile in spite of the ue losses involved.

As the coal situation stabilizes— it does—the market should see a ally turbulent period. Right now, dging from the rumors that are rculating, there are enough un- ercurrents moving to produce enty of surface repercussions er the next two months.

Dealers' receipts in most dis- icts were down. It was not gen- ally thought to be the end of the ring roundup, however, as floods, t of district buying and other ctors were the prime factors.

■

PITTSBURGH—Reports of weakness in penhearth prices here are being refuted market sources who say the contrary the case. But except for willingness some district buyers to pay high ringboards for out of district material, ere are no confirmed sales of open- arth scrap above the formula. Foun- ies are easing off on pressure for de- very on cast grades, but prospects of ghter pig iron supply have prevented ice weakness in cast iron scrap. Flood aters on the Ohio have cut off barge ipments and last week's floods here mbined with the rail cut held up a lot shipments. Those delayed by floods ere resumed early in the week. Heavy breakable cast moved 50¢ higher during the past week.

■

CHICAGO—Dealers here claim they know the pulse of the market, but they don't know the price. Small tonnages on new orders were placed by the mills last week at formula price, but brokers report they can't buy much at $39. Brokers, who paid higher prices a few weeks ago, and in some cases still are, claim the mill price has not changed. Observers say the bulls must have a place to go with the higher priced scrap and maybe these are cases of deals involving product. Railroad specialties continued to bring high prices, but some foundries are out of the market. Pig iron is being sought by one of the largest scrap brokers in this city. Errors in last week's turning and boring prices plus galvanized bundles should be corrected to read the same as those in this issue.

■

PHILADELPHIA—The market has a very strong undertone although there have been no price increases in heavy melting grades. It is reported that Harrisburg dealers are being offered $39.00 for heavy melting grades. In view of the strength of the market, mills are urging dealers to expedite shipments, and dealers are backing away from new commitments. All factors report improving shipments, but mill inventories are not gaining ground because of the heavy scrap consumption. Central Iron & Steel Co. shut down its openhearths last Thursday because of rising flood waters seeping through the checkerwork. Low phos grades and breakable cast are selling at higher prices. Chemical borings are in short supply because foundries have been returning them to the cupola, finding this practice cheaper than buying cast even with the flue losses involved.

■

CLEVELAND—Demand for openhearth material is very strong and is being matched by growing uncertainty as to price. Evidence that some of the big customers have been buying at over-the formula prices plus the fact that shipments to many consumers have been tapering off has added to the strength and uncertainty of the market here and in the Valley. While a holier-than-thou attitude prevails among consumers, large and small, there is little doubt that many customers are buying material at higher prices and selling it to mills at the formula, or having it made into ingots for their own use.

■

DETROIT—Substantial buying for a large mill here has helped to maintain formula prices for openhearth grades in this area. Collections are reported to be substantially improved with a favorable turn in the weather. The market for cast iron grades has shown definite indications of weakness, but a check of recnet buying indicates that existing prices are being maintained with only minor exceptions.

NEW YORK—The market continues to show remarkable steadiness and good activity. The trace of softness which the coal strike brought forth in the premium priced cast items continues, but foundries will be upping operations this week and a stronger market in cast scrap is anticipated in most quarters.

■

BIRMINGHAM—A stabilization of demand and prices marks the current scrap market in this district. Although consumer requirements still are considerably heavier than cast supplies, very substantial tonnages of that material are moving. Most of the scrap being produced in the Birmingham area is being used locally at present.

■

BUFFALO—Under pressure for a month, shcveling turnings last week tumbled $1.25 to $1.75 below the $36.75 formula as leading consumers stood firm in refusing to pay over machine shop ceiling for the heavier material. The price range represented the Buffalo price for shipments to nearby furnaces just outside the local area. Other prices were unchanged although cast iron and foundry steel were sloppy due to curtailed operations of users. Receipts at local yards were off sharply following a brisk movement in the preceding 3 weeks. One dealer attributed the reduction to heavy purchases in the territory east of Rochester by a Valley consumer who was reportedly paying $2.50 over formula.

■

BOSTON—Increased buying in chemical borings has lifted prices and the market for machinery cast. Breakable is also firmer. However, shipments of these and other materials are spotty because yards are reluctant to sell at current prices.

■

CINCINNATI—With the Ohio River above the flood stage and practically lapping at the foundations of many openhearths and cupolas, activity in the scrap market is at a minimum. Where operations are being maintained, demand is strong and shipments fair, and may improve with the weather.

■

ST. LOUIS—The coal strike freed additional cars for scrap movement and shippers took advantage of the situation to increase shipments. As a result, the mills' inventories are up. Settlement of the strike is expected, however, to tighten up the situation and return shipments to normal volume.

■

TORONTO—With renewed shipments of iron and steel scrap from the rural districts, dealers' receipts picked up during the past week or ten days, but the overall picture regarding scrap supply has shown little change. There is still hope that larger tonnages soon will start from Western Canada, the northern mining fields and farm communities, but it may be another 3 or 4 weeks before supplies from these sources have a noticeable effect on the market.

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. melting	$40.00 to $40.50
RR. hvy. melting	41.00 to 41.50
No. 2 hvy. melting	40.00 to 40.50
RR. scrap rails	55.50 to 56.50
Rails 2 ft and under	62.50 to 63.50
No. 1 comp'd bundles	40.00 to 40.50
Hand bdld. new shts.	40.00 to 40.50
Hvy. axle turn.	41.50 to 42.00
Hvy. steel forge turn.	41.50 to 42.00
Mach. shop turn.	35.50 to 36.00
Shoveling turn.	38.50 to 39.00
Mixed bor. and turn.	35.50 to 36.00
Cast iron boring	38.00 to 38.50
No. 1 cupola cast.	63.00 to 65.00
Hvy. breakable cast.	52.50 to 53.50
Malleable	77.00 to 79.00
RR. knuck. and coup.	54.00 to 55.00
RR. coil springs	54.00 to 55.00
RR. leaf springs	54.00 to 55.00
Rolled steel wheels	54.00 to 55.00
Low phos.	47.00 to 47.50

CHICAGO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.00 to $39.50
No. 2 hvy. melting	39.00 to 39.50
No. 1 bundles	39.00 to 39.50
No. 2 dealers' bundles	39.00 to 39.50
Bundled mach. shop turn.	37.00 to 37.50
Galv. bundles	35.00 to 35.50
Mach. shop turn.	34.00 to 34.50
Short shov. turn.	36.00 to 36.50
Cast iron borings	35.00 to 35.50
Mix. borings & turn.	34.00 to 34.50
Low phos. hvy. forge	44.00 to 48.00
Low phos. plates	42.50 to 45.00
No. 1 RR. hvy. melt.	41.75 to 43.50
Rerolling rails	52.00 to 54.00
Miscellaneous rails	50.00 to 52.00
Angles & splice bars	52.00 to 53.00
Locomotive tires, cut	54.00 to 55.00
Cut bolster & side frames	49.00 to 51.00
Standard stl. car axles	58.00 to 59.00
No. 3 steel wheels	51.00 to 52.00
Couplers & knuckles	51.00 to 52.00
Rails, 2 ft and under	55.00 to 57.00
Malleable	76.00 to 78.00
No. 1 mach. cast	73.00 to 75.00
No. 1 agricul. cast	61.00 to 65.00
Heavy breakable cast.	51.00 to 52.00
RR. grate bars	59.00 to 61.00
Cast iron brake shoes	58.00 to 60.00
Cast iron carwheels	58.00 to 60.00

CINCINNATI

Per gross ton delivered to consumer:

No. 1 hvy. melting	$38.50 to $39.50
No. 2 hvy. melting	38.50 to 39.50
No. 1 bundles	38.50 to 39.50
No. 2 bundles	38.50 to 39.50
Mach. shop turn.	33.00 to 33.50
Shoveling turn.	35.00 to 35.50
Cast iron borings	32.50 to 33.00
Mixed bor. & turn.	32.50 to 33.00
Low phos., plate	46.00 to 48.00
No. 1 cupola cast	63.00 to 64.00
Hvy. breakable cast.	53.00 to 54.00
Rails 18 in. & under	60.00 to 61.00
Rails random length	51.00 to 52.00
Drop broken	66.00 to 68.00

BOSTON

Dealers' buying prices, per gross ton, f.o.b. Boston

No. 1 hvy. melting	$31.65 to $31.90
No. 2 hvy. melting	31.65 to 31.90
Nos. 1 and 2 bundles	31.65 to 31.90
Busheling	31.65 to 31.90
Shoveling turn.	.... 28.90
Machine shop trun.	.... 26.90
Mixed bor. & turn.	.... 26.90
Cl'n cast chem. bor.	38.00 to 40.00
No. 1 machinery cast	56.00 to 60.00
No. 2 machinery cast	55.00 to 60.00
Heavy breakable cast.	50.00 to 52.00
Stove plate	53.00 to 55.00

DETROIT

Per gross ton, brokers' buying prices f.o.b. cars:

No. 1 hvy. melting	.... $35.50
No. 2 hvy. melting	.... 35.50
No. 1 bundles	.... 35.50
New busheling	.... 35.50
Flashings	.... 35.50
Mach. shop turn.	$29.00 to 29.50
Shoveling turn.	30.00 to 30.50
Cast iron borings	30.00 to 30.50
Mixed bor. & turn.	28.50 to 29.00
Low phos. plate	39.50 to 40.50
No. 1 cupola cast.	60.00 to 62.00
Heavy breakable cast.	52.00 to 56.00
Stove plate	52.00 to 55.00
Automotive cast.	62.00 to 65.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	38.00 to 39.00
No. 1 bundles	41.00 to 42.00
No. 2 bundles	38.00 to 39.00
Mach. shop turn.	33.50 to 34.50
Shoveling turn.	33.50 to 34.50
Mixed bor. & turn.	33.50 to 34.50
Clean cast chemical bor.	42.00 to 44.00
No. 1 machinery cast	65.00 to 66.00
No. 1 mixed yard cast.	62.00 to 63.00
Hvy. breakable cast.	61.00 to 62.00
Clean auto cast.	62.00 to 63.00
Hvy. axle forge turn.	43.00 to 44.00
Low phos. plate	47.00 to 48.00
Low phos. punchings	47.00 to 48.00
Low phos. bundles	45.00 to 46.00
RR. steel wheels	52.00 to 53.00
RR. coil springs	52.00 to 53.00
RR. malleable	72.00 to 75.00
Cast iron carwheels	68.00 to 70.00

ST. LOUIS

Per gross ton delivered to consumer:

No. 1 hvy. melting	$41.00 to $42.00
No. 2 hvy. melting	37.50 to 38.50
Bundled sheets	37.50 to 38.50
Mach. shop turn.	33.00 to 33.50
Locomotive tires, uncut	46.00 to 47.00
Mis. std. sec. rails	46.50 to 47.50
Steel angle bars	53.00 to 54.00
Steel angle bars	57.00 to 58.00
Rails 3 ft and under	53.00 to 55.00
RR. steel springs	47.50 to 48.50
Steel car axles	51.00 to 52.00
Grate bars	60.00 to 62.00
Brake shoes	58.00 to 60.00
Malleable	71.00 to 72.00
Cast iron car wheels	61.00 to 62.00
No. 1 machinery cast	65.00 to 67.00
Hvy. breakable cast.	59.00 to 60.00

BIRMINGHAM

Per gross ton delivered to consumer:

No. 1 hvy. melting	$37.50 to $38.50
No. 2 hvy. melting	37.50 to 38.50
No. 2 bundles	37.50 to 38.50
No. 1 busheling	37.50 to 38.50
Long turnings	25.00 to 26.00
Shoveling turnings	27.00 to 28.00
Cast iron borings	26.00 to 27.00
Bar crops and plate	42.50 to 43.50
Structural and plate	42.50 to 43.50
No. 1 cupola cast.	60.00 to 65.00
Stove plate	55.00 to 58.00
No. 1 RR. hvy. melt.	37.50 to 38.50
Steel axles	38.00 to 39.00
Scrap rails	44.00 to 45.00
Rerolling rails	52.00 to 54.00
Angles & splice bars	47.50 to 50.00
Rails 3 ft & under	52.00 to 56.00
Cast iron carwheels	48.00 to 50.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. melting	$40.00 to $40.50
No. 2 hvy. melting	40.00 to 40.50
Mach. shop turn.	35.00 to 35.50
Short shov. turn.	37.00 to 37.50
Cast iron borings	36.00 to 36.50
Low phos.	45.00 to 45.50

NEW YORK

Brokers' buying prices per gross ton, on cars:

No. 1 hvy. melting	.... $34.50
No. 2 hvy. melting	.... 34.50
No. 2 bundles	.... 34.50
Mach. shop turn.	$29.00 to 29.50
Mixed bor. & turn.	29.00 to 29.50
Shoveling turn.	31.00 to 32.00
No. 1 cupola cast.	55.00 to 56.00
Clean auto cast.	55.00 to 56.00
Hvy. breakable cast.	54.00 to 55.00
Charging box cast.	54.00 to 55.00
Stove plate	51.00 to 52.00
Unstrp. motor blks.	50.00 to 51.00
Cl'n cast chem. bor.	34.50 to 35.50

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.75 to $4
No. 2 hvy. melting	 3
No. 1 bundles	 3
No. 2 bundles	 3
No. 1 busheling	 3
Mach. shop turn.	 3
Shoveling turn.	35.00 to 3
Cast iron borings	 3
Mixed bor. & turn.	 3
Mixed cupola cast.	60.00 to 6
Charging box cast.	54.00 to 5
Stove plate	58.00 to 6
Clean auto cast.	60.00 to 6
RR. malleable	70.00 to 7
Small indl. malleable	47.00 to 4
Low phos. plate	44.75 to 4
Scrap rails	50.00 to 5
Rails 3 ft & under	57.00 to 5
RR. steel wheels	51.00 to 5
Cast iron carwheels	51.00 to 5
RR. coil & leaf spgs.	51.00 to 5
RR. knuckles & coup.	51.00 to 5

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. melting	$39.50 to $4
No. 2 hvy. melting	39.50 to 4
No. 1 bundles	39.50 to 4
No. 1 busheling	39.50 to 4
Drop forge flashings	39.50 to 4
Mach. shop turn.	34.50 to 3
Shoveling turn.	35.50 to 3
Steel axle turn.	39.50 to 4
Cast iron borings	35.50 to 3
Mixed bor. & turn.	35.50 to 3
Low phos.	44.50 to 4
No. 1 machinery cast.	65.00 to 7
Malleable	75.00 to 7
RR. cast.	70.00 to 7
Railroad grate bars	60.00 to 6
Stove plate	60.00 to 6
RR. hvy. melting	40.00 to 4
Rails 3 ft & under	60.00 to 6
Rails 18 in. & under	61.00 to 6

SAN FRANCISCO

Per gross ton f.o.b. shipping point:

No. 1 hvy. melting	.... $2
No. 2 hvy. melting	 2
No. 2 bales	 2

Per gross ton delivered to consumer:

No. 3 bales	.... $1
Mach. shop turn.	 1
Elec. furn. 1 ft under	$32.00 to 3
No. 1 cupola cast.	 4
RR. hvy. melting	 2

LOS ANGELES

Per gross ton delivered to consumer:

No. 1 hvy. melting	.... $2
No. 2 hvy. melting	 2
No. 1 bales	 2
No. 2 bales	 2
No. 3 bales	 1
Mach. shop turn.	 1
No. 1 cupola cast.	$40.00 to 4
RR. hvy. melting	 2

SEATTLE

Per gross ton delivered to consumer:

No. 1 & No. 2 hvy. melt.	.... $2
Elec. furn. 1 ft and under	 3
No. 1 cupola cast.	 4
RR. hvy. melting	 2

HAMILTON, ONT.

Per gross ton delivered to consumer: Cast grades f.o.b. shipping point.

Heavy melting	$22.
No. 1 bundles	22.
No. 2 bundles	21.
Mechanical bundles	20.
Mixed steel scrap	19.
Mixed borings and turnings	17.
Rails, remelting	23.
Rails, rerolling	26.
Bushelings	17.
Bushelings, new fact, prep'd	21.
Bushelings, new fact, unprep'd	16.
Short steel turnings	17.
No. 1 cast	$42.00 to 46.
No. 2 cast	35.00 to 37.

*Ceiling Price.

NONFERROUS METALS

. . . News and Market Activities

Copper

• • • **Major producers** of copper were all but sold out of May copper last week. Export demand is high and the price ranges between 21.50¢ and the equivalent of 22¢ per lb f.a.e. New York for nearby delivery. Brass mills are operating at a normally high rate and are consuming copper at a high level. Brass mill order backlogs are all but gone, however, and almost any product may be obtained for delivery within a week or two. Demand for brass rod is not sufficient to require the capacity of the industry.

Copper producers are not expecting any moves by the government to step up the stockpiling program as the result of the industry advisory committee meeting with the Munitions Board. Observers estimates of the tonnage of copper which will be required to implement the ERP set it at about 60,000 tons a year. While this is not a large tonnage, when added to a market which is unable to supply all domestic demand, it will be sufficient to have an important bearing on market developments. However, the industry is more concerned with the effect of the rearmament program. It is too early to predict the impact on the copper market but according to some members of the industry an effective program would be sure to require some form of government allocations and price control. Congressional action would be necessary to reinstitute controls.

Copper shipments to domestic consumers reached 122,988 short tons in March, according to the Copper Institute, an increase of 16,000 tons from the previous month. Refined copper production during March was 110,886 tons, increased 17,000 tons above February.

Lead

• • • **Lead producers** are scheduled to meet this week with officials of the Army-Navy Munitions Board with a view toward canvassing the prospect of accelerated stockpiling. The meeting is not to be expected to bring any tangible results in view of the overall shortage of lead in the domestic market. The recent price increase has been effective in obtaining some 20,000 to 25,000 tons of Australian lead for delivery during the remainder of the year at 17½¢ duty paid. While this will represent only some 3000 tons per month, it should do something to relieve the shortage. It is also reported that some additional lead concentrates have been uncovered at the higher price.

•

Brass, Aluminum Prices Up

New York

• • • **Higher prices prevail** in the brass and aluminum ingot market, and scrap buying prices of refiners and ingot makers have been advanced. The aluminum ingot market is much more active than recently which producers attribute to the diminishing volume of scrap on the market which is expected to lead to higher ingot prices and the possibility of a shortage under the pressure of the rearmament program. An important change in the ingot market lies in the fact that the ingot producer who was formerly the low price seller in a number of grades is selling at prices higher than others in the industry.

As the result of the higher prices being paid by refiners and ingot makers, dealers buying prices for copper and brass grades have been advanced by ¼¢ per lb. Cast aluminum grades and sheet and utensils have been increased to a range of 7¢ to 7½¢ per lb. Other metals remain unchanged.

Tin

• • • **The interest** of the tin trade centers around the meeting of the International Tin Study Group in Washington this week. The March report of the Group estimates world production of tin in ore in January to be 11,600 long tons, down 700 tons from the peak December production, reflecting a drop of 1000 tons in Bolivian exports. World production of tin metal in January was only 11,900 tons, down 900 from peak December production, due principally to a decline of over 1200 tons in Netherlands production to a low point of 429 tons in January.

The office of Metals Reserve tin stockpile at the end of March has been reported as 26,815 long tons, a decline of 271 tons in the month. Although this represents a minor decline in United States, stocks of tin, it is a very definite improvement in our tin position as compared with that of six months and a year ago when stocks were 6000 tons lower, and inventories dropped to only 16,000 tons in some of the intervening months. Allocations to domestic consumers in March were 5175 tons, the level at which they have been held during the first quarter. November and December allocations were some 400 tons lower, but these were increased allocations from a much lower level.

•

Raise Lead Prices

Toronto

• • • **Canadian producers** have advanced their prices for lead 2½¢ per lb to 16.75¢, delivered Toronto and Montreal. Copper and zinc prices remain unchanged at 21.50¢ and 12.50¢ per lb, respectively, delivered Toronto and Montreal.

Demand for lead, copper and zinc continues heavy, and recently new commitments have been made with Great Britain which will result in a larger flow of these materials to England, which may be reflected in some curtailment of shipments to the United States. Canadian producers are maintaining output, but it is not expected there will be much increase over last year.

Nonferrous Metals Prices

	Apr. 14	Apr. 15	Apr. 16	Apr. 17	Apr. 19	Apr. 20
Copper, electro, Conn.	21.50	21.50	21.50	21.50	21.50	21.50
Copper, Lake, Conn.	21.625	21.625	21.625	21.625	21.625	21.625
Tin, Straits, New York	94.00	94.00	94.00	94.00	94.00	94.00
Zinc, East St. Louis	12.00	12.00	12.00	12.00	12.00	12.00
Lead, St. Louis	17.30	17.30	17.30	17.30	17.30	17.30

Primary Metals

(Cents per lb. unless otherwise noted)

Aluminum, 99+%, 10,000 lb, f.o.b shipping point, freight allowed	15.00
Aluminum pig, f.o.b. shipping point	14.00
Antimony, American, Laredo, Tex.	33.00
Beryllium copper, 3.75-4.25% Be dollars per lb contained Be	$20.50
Beryllium aluminum 5% Be, dollars per lb contained Be	$40.00
Cadmium, del'd	$1.75
Cobalt, 97-99% (per lb)	$1.65 to $1.72
Copper electro, Conn. Valley	21.50
Copper, lake, Conn. Valley	21.625
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.8%, dollars per troy oz.	$2.25
Iridium, dollars per troy oz.	$105 to $115
Lead, St. Louis	17.30
Lead, New York	17.50
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, carlots	34.50
Mercury, dollars per 76-lb flask, f.o.b. New York	$76.50 to $77
Nickel, electro, f.o.b. New York	36.56
Palladium, dollars per troy oz	$24.00
Platinum, dollars per troy oz.	$98 to $101
Silver, New York, cents per oz.	74.625
Tin, Grade A, New York	94.00
Zinc, East St. Louis	12.00
Zinc, New York	12.61
Zirconium copper, 6 pct Zr, per lb contained Zr.	$8.75

Remelted Metals

Brass Ingot

(Cents per lb, in carloads)

85-5-5-5 ingot	
No. 115	19.25-19.50
No. 120	18.75-19.00
No. 123	18.25-18.50
80-10-10 ingot	
No. 305	24.25
No. 315	21.75
88-10-2 ingot	
No. 210	30.00
No. 215	28.00
No. 245	22.25-22.75
Yellow ingot	
No. 405	15.25-16.00
Manganese bronze	
No. 421	18.00

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	18.75-19.00
0.60 copper, max.	18.50-18.75
Piston alloys (No. 122 type)	17.25-17.50
No. 12 alum. (No. 2 grade)	17.00-17.25
108 alloy	17.25-17.75
195 alloy	17.50-18.00
AXS-679	17.25-17.75
Steel deoxidizing aluminum, notch-bar granulated or shot	
Grade 1—95 pct-95½ pct.	17.25-17.75
Grade 2—92 pct-95 pct.	16.75-17.00
Grade 3—90 pct-92 pct.	16.25-16.75
Grade 4—85 pct-90 pct.	15.75-16.25

Electroplating Supplies

Anodes

(Cents per lb, f.o.b. shipping point in 500 lb lots)

Copper, frt. allowed	
Cast, oval, 15 in. or longer	37⅝
Electrodeposited	32⅜
Rolled, oval, straight, delivered	33.09
Brass, 80-20, frt. allowed	
Cast, oval, 15 in. or longer	33⅜
Zinc, cast, 99.99	20.50
Nickel 99 pct plus, frt. allowed	
Cast	51
Rolled, depolarized	52
Silver 999 fine	
Rolled, 1000 oz lots per troy oz.	67¼

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	43.00
Copper sulfate, 99.5, crystals, bbls.	11.50
Nickel salts, single, 425 lb bbls. frt. allowed	14.50
Silver cyanide, 100 oz. lots, per oz.	54.00
Sodium cyanide, 96 pct domestic, 100 lb drums	15.00
Zinc cyanide, 100 lb drums	34.00
Zinc sulfate, 89 pct, granules, bbls, frt. allowed	7.75

Mill Products

Aluminum

(Base prices, cents per pound, base 30,000 lb., f.o.b. shipping point, freight allowed.)

Flat Sheet: 0.188 in., 2S, 3S, 24¢; 4S, 61S-O, 25.8¢; 52S, 27.7¢; 24S-O, 24S-OAL, 26.7¢; 75S-O, 75S-OAL, 32.7¢. 0.081 in.; 2S, 3S, 25¢; 4S, 61S-O, 27.1¢; 52S, 29¢; 24S-O, 24S-OAL, 27.7¢; 75S-O, 75S-OAL, 34.3¢. 0.032 in.; 2S, 3S, 26.4¢; 4S, 61S-O, 30.1¢; 52S, 32.6¢; 24S-O, 24S-OAL, 34.2¢; 75S-O, 75S-OAL, 43.1¢.

Plate: ¼ in. and heavier; 2S, 3S, 21.2¢; 4S-F, 23.2¢; 52S, 24.2¢; 61S-O, 23.8¢; 24S-F,24S-FAL, 24.2¢; 75S, 75S-AL, 30.5¢.

Extruded Solid Shapes: Shape factors 1 to 4; 31¢ to 59¢; 11 to 13, 31.9¢ to 69c; 23 to 25, 33.4c to 90¢; 35 to 37, 40.8¢ to $1.25; 47 to 49, 53.7¢ to $1.84.

Extruded Round Rod, Square, Hex, Octagonal Bar: ¼ in. and over, 27¢ to 38¢; ½ to ¾ in., 28¢ to 40.5¢; ⅜ to ½ in., 29c to 43c; ¼ to ⅜ in., 30¢ to 46.5¢; ⅛ to 3/32 in., 32.5¢ to 38.5¢; 9/64 to 5/32 in., 35.5¢ to 62¢.

Rolled Rod: 1.064 to 4.5 in., 2S, 3S, 30¢ to 26.5¢; Cold-finished rod, 0.375 to 3.5 in., 2S, 3S, 32¢ to 28¢.

Screw Machine Stock: Drawn, ½ to ⅛ in., 11S-T3, 34¢ to 45¢; cold-finished, ⅝ to 1½ in., 11S-T3, 33¢ to 31¢; rolled, 1⅜ to 3 in., 11S-T3, 31¢ to 28.5¢.

Drawn Wire: coiled, 0.051 to 0.374 in.; 2S, 33¢ to 24¢ 52S, 40.5c to 29c; 56S, 42.5¢ to 34.5¢; 17S-T4, 46¢ to 31¢; 61S-T4, 41c to 30.5c; 75S-T6, 66¢ to 46¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed. Base quantity 30,000 lb.)

Sheet and Plate: Ma. FSa. ¼ in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58c-60c; 10, 59c-61c; 12, 63-65c; 14, 69c-74c; 16, 76c-81c; 18, 84c-89c 20, 96c-$1.01; 22, $1.22-$1.31; 24, $1.62-$1.75. Specification grade higher.

Round Rod: M, diam., in., ¼ to ⅜, 47¢; ½ to ¾, 45¢; 1¼ to 2½, 43.5¢; 3½ to 5, 42.5¢. Other alloys higher.

Square, Hexagonal Bar: M, size across flats, in., ¼ to ⅜, 52.5¢; ½ to ¾, 47.5¢; 1¼ to 2½, 45¢; 3½ to 5, 44¢. Other alloys higher.

Solid Shapes, Rectangles: M, form factors, 1 to 4, 46¢; 11 to 13, 49¢; 20 to 22, 51.5¢; 29 to 31, 59.5¢; 38 to 40, 75.5¢; 47 to 49, 98¢. Other alloys higher.

Round Tubing: M. wall thickness, outside diam, in., 0.049 to 0.057, ¼ to 1/16, $1.21; 1/16 to ⅛, $1.12; ⅛ to 1/16, 97¢; 0.058 to 0.064, 1/16 to ½, 89¢; ½ to ⅝, 81¢; 0.065 to 0.082, ⅝ to ¾, 76¢; ¾ to 1, 72¢; 0.083 to 0.108, 1 to 2, 68¢; 0.165 to 0.219, 2 to 3, 59¢; 3 to 4, 57¢. Other alloys higher.

Nickel and Monel

(Cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	54	43
No. 35 sheets		41
Strip, cold-rolled	60	44
Rod		
Hot-rolled	50	39
Cold-drawn	55	44
Angles, hot-rolled	50	39
Plates	52	41
Seamless tubes	83	71
Shot and blocks		31

Copper, Brass, Bronze

(Cents per pound, freight prepaid on 200 lb)

	Extruded Shapes	Rods	Sheets
Copper	33.53	....	33.68
Copper, hot-rolled	....	30.03	....
Copper, drawn	....	31.03	....
Low brass	34.36*	31.39	31.70
Yellow brass	32.92*	29.85	30.16
Red brass	34.39*	31.92	32.23
Naval brass	30.28	29.03	34.97
Leaded brass	28.64	24.69	....
Commercial bronze	35.68*	32.96	33.27
Manganese bronze	33.87	32.37	38.47
Phosphor bronze, 5 pct	53.95*	52.95	52.70
Muntz metal	29.80	28.55	32.99
Everdur, Herculoy, Olympic, etc.	37.24	37.50	38.56
Nickel silver, 10 pct.	41.80	42.68	40.54
5 pct	....	....	38.98
Architectural bronze	28.61	....	....

*Seamless tubing.

Scrap Metals

Brass Mill Scrap

(Cents per pound; add 1¢ per lb for shipments of 15,000 lb or more.)

	Heavy	Turnings
Copper	19⅛	18⅝
Yellow brass	15⅝	14⅝
Red brass	17⅛	16⅝
Commercial bronze	17⅝	16⅞
Manganese bronze	15¼	14⅝
Leaded brass rod ends	15¾	....

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery.)

No. 1 copper, wire	18.75–19.00
No. 2 copper, wire	17.75–18.00
Light copper	16.75–17.75
Refinery brass	16.50–16.75*

*Dry copper content.

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer.)

No. 1 copper, wire	18.25
No. 2 copper, wire	17.25
Light copper	16.25
No. 1 composition	15.00
No. 1 comp. turnings	14.50
Rolled brass	11.00–11.25
Brass pipe	11.50–11.75
Radiators	11.75–12.00
Heavy yellow brass	10.75–11.00
Aluminum	
Mixed old cast	10.00
Mixed old clips	9.50
Mixed turnings	9.00
Pots & pans	10.25
Low copper	10.50–10.75

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound.)

Copper and Brass	
No. 1 heavy copper and wire	16½—17
No. 2 heavy copper and wire	15½—16
Light copper	14¼—14⅜
Auto radiators (unsweated)	10 —10½
No. 1 composition	12¾—13⅛
No. 1 composition turnings	12¼—12⅜
Clean red car boxes	9¾—10¼
Cocks and Faucets	10 —10½
Mixed heavy yellow brass	8 — 8⅛
Old rolled brass	9½—10
Brass pipe	10 —10⅛
New soft brass clippings	12¼—12⅜
Brass rod ends	10 —10½
No. 1 brass rod turnings	9½—10
Aluminum	
Alum. pistons with struts	4½— 5
Aluminum crankcases	7 — 7⅛
2S aluminum clippings	9 — 9⅛
Old sheet & utensils	7 — 7⅛
Dry borings and turnings	2½— 3
Misc. cast aluminum	7 — 7½
Dural clips (24S)	6 — 6½
Zinc	
New zinc clippings	8 — 8⅛
Old zinc	5½— 5⅝
Zinc routings	3 — 3⅛
Old die cast scrap	4 — 4⅛
Nickel and Monel	
Pure nickel clippings	16 —17
Clean nickel turnings	12½—13
Nickel anodes	16 —17
Nickel rod ends	16 —17
New Monel clippings	12 —13
Clean Monel turnings	7 — 8
Old sheet Monel	10 —10½
Old Monel castings	7½— 8
Inconel clippings	8 — 8⅛
Nickel silver clippings, mixed	8 — 8⅛
Nickel silver turnings, mixed	6½— 7
Lead	
Soft scrap lead	14½—15
Battery plates (dry)	8¾— 9
Magnesium Alloys	
Segregated solids	7½— 8
Castings	4½— 5½
Miscellaneous	
Block tin	75 —77
No. 1 pewter	60 —62
No. 1 auto babbitt	45 —47
Mixed common babbitt	14¼—14⅜
Solder joints	17¼—17⅜
Siphon tops	45 —47
Small foundry type	17½—18
Monotype	16¼—16⅜
Lino. and stereotype	15½—15⅝
Electrotype	12½—13
New type shell cuttings	14½—15
Hand picked type shells	6½— 7
Lino and stereo dross	8 — 8½
Electro dross	6 — 6½

Comparison of Prices . .

Advances over past week in Heavy Type, declines in *Italics*. Prices are f.o.b. major basing points. The various basing points for finished and semifinished steel are listed in the detailed price tables.

Flat-Rolled Steel: (cents per pound)	Apr. 20, 1948	Apr. 13, 1948	Mar. 23, 1948	Apr. 22, 1947
Hot-rolled sheets	2.80	2.80	2.80	2.50
Cold-rolled sheets	3.55	3.55	3.55	3.20
Galvanized sheets (10 ga.)	3.95	3.95	3.95	3.55
Hot-rolled strip	2.80	2.80	2.80	2.50
Cold-rolled strip	3.55	3.55	3.55	3.20
Plates	2.95	2.95	2.95	2.65
Plates wrought iron	7.25	7.25	7.25	5.95
Stain's c-r strip (No. 302)	30.50	30.50	30.50	30.50
Tin and Terneplate: (dollars per base box)				
Tinplate (1.50 lb) cokes.	$6.80	$6.80	$6.80	$5.75
Tinplate, electro (0.50 lb)	6.00	6.00	6.00	5.05
Special coated mfg. ternes	5.90	5.90	5.90	4.90
Bars and Shapes: (cents per pound)				
Merchant bars	2.90	2.90	2.90	2.60
Cold-finished bars	3.55	3.55	3.55	3.20
Alloy bars	3.30	3.30	3.30	3.05
Structural shapes	2.80	2.80	2.80	2.50
Stainless bars (No. 302)	26.00	26.00	26.00	26.00
Wrought iron bars	8.65	8.65	8.65	6.15
Wire: (cents per pound)				
Bright wire	3.55	3.55	3.55	3.30
Rails: (dollars per 100 lb)				
Heavy rails	$2.75	$2.75	$2.75	$2.50
Light rails	3.10	3.10	3.10	2.85
Semifinished Steel: (dollars per gross ton)				
Rerolling billets	$45.00†	$45.00†	$45.00†	$42.00
Slabs, rerolling	45.00†	45.00†	45.00†	42.00
Forging billets	54.00†	54.00†	54.00†	50.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	61.00
Wire Rods and Skelp: (cents per pound)				
Wire rods	2.80	2.80	2.80	2.55
Skelp	2.90	2.90	2.90	2.35

† Net ton

Pig Iron: (per gross ton)	Apr. 20, 1948	Apr. 13, 1948	Mar. 23, 1948	Apr. 22, 1947
No. 2, foundry, Phila.	$44.61	$44.61	$44.61	$36.51
No. 2, Valley furnace	39.50	39.50	39.50	33.50
No. 2, Southern Cin'ti	43.28	43.28	43.28	34.75
No. 2, Birmingham	37.38	37.38	37.38	29.88
No. 2, foundry, Chicago†	39.00	39.00	39.00	33.00
Basic del'd Philadelphia	44.11	44.11	44.11	36.92
Basic, Valley furnace	39.00	39.00	39.00	33.00
Malleable, Chicago†	39.50	39.50	39.50	33.50
Malleable, Valley	39.50	39.50	39.50	33.50
Charcoal, Chicago	62.46	62.46	62.46	45.99
Ferromanganese‡	145.00	145.00	145.00	135.00

† The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡ For carlots at seaboard.

Scrap: (per gross ton)				
Heavy melt'g steel, P'gh.	$40.25	$40.25	$40.25	$32.25
Heavy mlt'g steel, Phila.	41.50	41.50	41.50	30.50
Heavy melt'g steel, Ch'go	39.25	39.25	39.00	32.75
No. 1, hy. comp. sh't, Det.	35.50	35.50	35.50	29.75
Low phos. Young'n	45.25	45.25	45.25	38.25
N.. 1, cast, Pittsburgh	64.00	64.00	62.00	44.75
No. 1, cast, Philadelphia	65.50	65.50	65.50	45.50
No. 1, cast, Chicago	74.00	74.00	69.00	40.50
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$12.50	$12.50	$12.50	$10.50
Foundry coke, prompt	14.00	14.00	14.00	11.25
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electro. Conn.	21.50	21.50	21.50	21.50
Copper, Lake Conn.	21.625	21.625	21.625	21.625
Tin, Grade A, New York	94.00	94.00	94.00	80.00
Zinc, East St. Louis	12.00	12.00	12.00	10.50
Lead, St. Louis	17.30	17.30	14.80	14.80
Aluminum, virgin	15.00	15.00	15.00	15.00
Nickel, electrolytic	36.56	36.56	36.56	37.67
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	33.00	33.00	33.00	33.00

Composite Prices . .

Starting with the issue of Apr. 22, 1943, the weighted finished steel index was revised for the years 1941, 1942, and 1943. See explanation of the change on p. 90 of the Apr. 22, 1943, issue. Index revised to a quarterly basis as of Nov. 16, 1944; for details see p. 98 of that issue. The finished steel composite price for the current quarter is an estimate based on finished steel shipments for the previous quarter. This figure will be revised when shipments for this quarter are compiled.

	FINISHED STEEL (Base Price)	PIG IRON	SCRAP STEEL
Apr. 20, 1948	3.23940¢ per lb.	$40.11 per gross ton	$40.33 per gross ton
ne week ago	3.23940¢ per lb.	$40.11 per gross ton	$40.33 per gross ton
ne month ago	3.23940¢ per lb.	$40.29 per gross ton	$40.25 per gross ton
ne year ago	2.86354¢ per lb.	$33.15 per gross ton	$31.83 per gross ton

	HIGH	LOW	HIGH	LOW	HIGH	LOW
948	3.23940¢ Feb. 17	3.19411¢ Jan. 6	$40.37 Feb. 17	$39.58 Jan. 6	$41.83 Jan. 29	$39.75 Mar. 9
947	3.19541¢ Oct. 7	2.87118¢ Jan. 7	37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
946	2.83599¢ Dec. 31	2.54490¢ Jan. 1	30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
945	2.44104¢ Oct. 2	2.38444¢ Jan. 2	25.37 Oct. 23	23.61 Jan. 2	19.17 Jan. 2	18.92 May 22
944	2.30837¢ Sept. 5	2.21189¢ Oct. 5	$23.61	$23.61	19.17 Jan. 11	15.76 Oct. 24
943	2.29176¢	2.29176¢	23.61	23.61	$19.17	$19.17
942	2.28249¢	2.28249¢	23.61	23.61	19.17	19.17
941	2.43078¢	2.43078¢	$23.61 Mar. 20	$23.45 Jan. 2	$22.00 Jan. 7	$19.17 Apr. 10
940	2.30467¢ Jan. 2	2.24107¢ Apr. 16	23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
939	2.35367¢ Jan. 3	2.26689¢ May 16	22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
938	2.58414¢ Jan. 4	2.27207¢ Oct. 18	23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
937	2.58414¢ Mar. 9	2.32263¢ Jan. 4	23.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
936	2.32263¢ Dec. 28	2.05200¢ Mar. 10	19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
935	2.07642¢ Oct. 1	2.06492¢ Jan. 8	18.84 Nov. 5	17.83 May 14	13.42 Dec. 10	10.33 Apr. 29
934	2.15367¢ Apr. 24	1.95757¢ Jan. 2	17.90 May 1	16.90 Jan. 27	13.00 Mar. 13	9.50 Sept. 25
933	1.95578¢ Oct. 3	1.75836¢ May 2	16.90 Dec. 5	13.56 Jan. 3	12.25 Aug. 8	6.75 Jan. 3
932	1.89196¢ July 5	1.83901¢ Mar. 1	14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
931	1.99626¢ Jan. 13	1.86586¢ Dec. 29	15.90 Jan. 6	14.79 Dec. 15	11.33 Jan. 6	8.50 Dec. 20
930	2.25488¢ Jan. 7	1.97319¢ Dec. 9	18.21 Jan. 7	15.90 Dec. 16	15.00 Feb. 18	11.25 Dec. 9
929	2.31773¢ May 28	2.26498¢ Oct. 29	18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. basing points in cents per pound or dollars per gross ton unless otherwise indicated. Extras apply. Delivered prices do not reflect 3 pct tax on freight. Industry practice has discontinued arbitrary f.o.b. prices at Gulf and Pacific Ports. Space limitations prevent quotation of delivered prices at major ports. (1) Commercial quality sheet grade; primes, 25¢ above base. (2) Commercial quality grade. (3) Widths up to 12-in. inclusive. (4) 0.25 carbon and less. (5) Cokes, 1.25 lb, deduct 20¢ per base box. (6) For merchant trade. (7) For straight length material only from producers to fabricators. (8) Also shafting. For quantities of 40,000 lb & over. (9) Carload lot in manufacturing trade. (10) Delivered Los Angeles only. (11) Hollowware enameling, gages 29 to 31 only. (12) Produced to dimensional tolerances in AISI Manual Sec. 6. (13) Delivered San Francisco only. (14) Kaiser Co. prices (15) to 0.035 to 0.075 in. thick by ¾ to 31½ in. wide. (16) Delivered Los Angeles; add ½¢ per 100 lb for San Francisco. (17) Slab prices subject to negotiation in most cases. Some producers charge (18) $2 more. (19) $1 per ton more.

Basing Points	Pitts-burgh	Chicago	Gary	Cleve-land	Birm-ingham	Buffalo	Youngs-town	Spar-rows Point	Granite City	Middle-town, Ohio		San Franc'co, Los Angeles, Seattle	DELIVERED TO Detroit	New York	Phila-delphia
INGOTS Carbon, rerolling	($36.00 per net ton f. o. b. mill) (Spot market as high as $75 to $90 gross ton)														
Carbon, forging	$46.00	(per net ton)													
Alloy	$56.00									(Canton = $56.00)					
BILLETS, BLOOMS, SLABS Carbon, rerolling[17]	$45.00[18]	$45.00[18]	$45.00[18]	$47.00	$45.00[18]	$45.00[18]	(per net ton)								
Carbon forging billets	$54.00	$54.00	$54.00	$54.00	$54.00	$54.00	(per net ton)								
Alloy	$66.00	$66.00				$66.00	(Bethlehem, Massillon, Canton = $66.00)								
SHEET BARS	Subject to negotiation														
PIPE SKELP	2.90¢						2.90¢								
WIRE RODS	2.80¢[19]	2.80¢		2.80¢	2.85¢		(Worcester = 2.90¢)					3.52¢[13]			
SHEETS Hot-rolled	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢	2.80¢		(Ashland, Ky. = 2.80¢)		3.54¢[16]	3.01¢	3.148¢	3.040¢
Cold-rolled[1]	3.55¢	3.55¢	3.55¢	3.55¢		3.55¢	3.55¢		3.65¢	3.55¢			3.76¢	4.00¢	4.016¢
Galvanized (10 gage)	3.95¢	3.95¢	3.95¢		3.95¢		3.95¢	3.95¢	4.05¢	3.95¢	(Ashland = 3.95¢)	4.62¢[16]		4.298¢	4.190¢
Enameling (12 gage)	3.95¢	3.95¢	3.95¢	3.95¢			3.95¢		4.05¢	3.95¢			4.18¢	4.466¢	4.406¢
Long ternes[3] (10 gage)	4.05¢		4.05¢											4.566¢	4.506¢
STRIP Hot-rolled[3]	2.80¢	2.80¢	2.80¢	2.80¢[15]	2.80¢		2.80¢					3.60¢[16]	3.01¢	3.318¢	3.256¢
Cold-rolled[4]	3.55¢	3.65	3.65¢	3.55¢			3.55¢			(Worcester = 3.75¢)			3.78¢	4.066¢	4.006¢
Cooperage stock	3.10¢	3.10¢			3.10¢		3.10¢							3.616¢	
TINPLATE Cokes, 1.50 lb[5], base box	$6.80	$6.80	$6.80		$6.90			$6.90	$6.90	(Warren, Ohio = $6.80)				$7.248	$7.140
Electro, box 0.25 lb	Deduct $1.00 from 1.50 lb coke base box price.														
Electro, box 0.50 lb	Deduct 80¢ from 1.50 lb coke base box price.														
Electro, box 0.75 lb	Deduct 60¢ from 1.50 lb coke base box price.														
TERNES, MFG., special coated	Deduct 90¢ from 1.50 lb coke base box price.														
BLACKPLATE, CANMAKING 55 lb to 70 lb	Deduct $1.60 from 1.50 lb coke base box.														
BLACKPLATE, CANMAKING 75 lb to 95 lb	Deduct $1.70 from 1.50 lb coke base box.														
BLACKPLATE, CANMAKING 100 lb to 128 lb	Deduct $1.60 from 1.50 lb coke base box.														
BLACKPLATE, h. e. 29 ga[11]	4.75¢	4.75¢	4.75¢		4.85¢			4.85¢	4.85¢					5.198¢	5.090¢
BARS Carbon steel	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢	2.90¢					3.625¢[16]	3.11¢	3.35¢	3.356¢
Rail steel[6]	Subject to negotiation because of fluctuating scrap prices.														
Reinforcing (billet)[7]	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢	2.75¢				3.325¢[16]		3.098¢	2.990¢
Reinforcing (rail)	Subject to negotiation because of fluctuating scrap prices.														
Cold-finished[8]	3.55¢	3.55¢	3.55¢	3.55¢		3.55¢							3.71¢	4.00¢	4.006¢
Alloy, hot-rolled	3.30¢	3.30¢	3.30¢			3.30¢	3.30¢	(Bethlehem, Massillon, Canton = 3.30¢)					3.51¢		3.432¢
Alloy, cold-drawn	4.10¢	4.10¢	4.10¢	4.10¢		4.10¢			(Canton = 4.10¢)						
PLATE Carbon Steel[12]	2.95¢	2.95¢	2.95¢	2.95¢	2.95¢		2.95¢	(Coatesville = 3.45¢, Claymont = 3.65¢, Geneva, Utah = 3.10¢) 2.95¢				3.838¢[14]		3.298¢	3.190¢
Floor plates	4.20¢	4.20¢		4.20¢										4.718¢	4.656¢
Alloy	3.80¢	3.80¢	3.80¢		(Coatesville = 4.80¢)									4.316¢	4.256¢
SHAPES, Structural	2.80¢	2.80¢	2.80¢		2.80¢	2.80¢	(Geneva, Utah = 2.95¢, Bethlehem = 2.80¢)					3.43¢[10]		3.040¢	2.932¢
SPRING STEEL, C-R 0.08 to 0.40 carbon	3.55¢			3.55¢			(Worcester = 3.75¢)								
0.41 to 0.60 carbon	5.05¢			5.05¢			(Worcester = 5.25¢)								
0.61 to 0.80 carbon	5.65¢			5.65¢			(Worcester = 5.85¢)								
0.81 to 1.05 carbon	7.15¢			7.15¢			(Worcester = 7.35¢)								
1.06 to 1.35 carbon	9.45¢			9.45¢			(Worcester = 9.65¢)								
MANUFACTURERS' WIRE[9] Bright	3.55¢	3.55¢		3.55¢	3.55¢		(Worcester = 3.65¢, Duluth = 3.60¢)					4.56¢[13]		4.022¢	4.006¢
Galvanized	Add proper size extra and galvanizing extra to Bright Wire Base														
Spring (high carbon)	4.60¢	4.60¢		4.60¢	(Worcester = 4.70¢, Duluth = 4.85¢) (Trenton = 4.85¢)							5.737¢[13]		5.072¢	4.964¢
PILING, Steel sheet	3.30¢	3.30¢				3.30¢								3.75¢	3.756¢

CORROSION AND HEAT RESISTANT STEELS

In cents per pound, f.o.b. basing point

Basing Point	Chromium Nickel		Straight Chromium			
	No. 304	No. 302	No. 410	No. 430	No. 442	No. 446
Ingot, P'gh, Chi, Canton, Balt, Reading, Ft. Wayne, Phila.	Subject to negotiation			Subject to negotiation		
Blooms, P'gh, Chi, Canton, Phila, Reading, Ft. Wayne, Balt.	Subject to negotiation			Subject to negotiation		
Slabs, P'gh, Chi, Canton, Balt, Phila, Reading	Subject to negotiation			Subject to negotiation		
Billets, P'gh, Chi, Canton, Watervliet, Syracuse, Balt, Beth.	Subject to negotiation			Subject to negotiation		
Billets, forging, P'gh, Chi, Canton, Dunkirk, Balt, Phila, Reading, Water, Syracuse, Ft. Wayne, Titusville, Beth, Brackenridge	23.00	22.50	17.50	17.50	21.00	25.50
Bars, h-r, P'gh, Chi, Canton, Dunkirk, Watervliet, Syracuse, Balt· Phila, Reading, Ft. Wayne, Titusville, Beth, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Bars, c-f, P'gh, Chi, Cleve, Canton, Dunkirk, Syracuse, Balt, Phila, Reading, Ft. Wayne, Watervliet, Beth, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Plates, P'gh, Middletown, Canton, Brackenridge, Balt, Coatesville	31.50	29.50	23.50	24.00	28.00	33.00
Shapes, structural, P'gh, Chi, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Sheets, P'gh, Chi, Middletown, Canton, Balt, Brackenridge	39.00	37.00	29.00	31.50	35.50	39.50
Strip, h-r, P'gh, Chi, Reading, Canton, Youngstown	25.50	23.50	18.50	19.00	28.00	38.00
Strip, c-r, P'gh, Cleve, Jersey City, Reading, Canton, Youngstown, Balt, W. Leechburg	32.50	30.50	24.00	24.50	35.00	56.50
Wire, c-d, Cleve, Dunkirk, Syracuse, Balt, Reading, Canton, P'gh, Newark, N. J., Phila, Ft. Wayne, Brackenridge	27.50	26.00	20.50	21.00	24.50	30.00
Wire, flat, c-r, Cleve, Balt, Reading, Dunkirk, Canton, W. Leechburg	32.46	30.30	23.80	24.34	34.82	56.26
Rod, h-r, Syracuse	27.05	25.97	20.02	20.56	24.34	28.76
Tubing, seamless, P'gh, Chi, Canton, Brackenridge, Milwaukee	72.09	72.09	.....	68.49	.....	.....

TOOL STEEL

*F.o.b. Pittsburgh, Bethlehem, Syracuse, Dunkirk. *Also Canton, Ohio)*

W	Cr	V	Mo	Co		Base per lb
18	4	1	—	—	....	82¢
18	4	1	—	5	....	$1.29
18	4	2	—	—	....	93¢
1.5	4	1.5	8	—	....	59¢
6	4	2	6	—	....	63¢

gh-carbon-chromium* ..... 47¢
l hardening manganese* ..... 26¢
ecial carbon* ..... 24¢
xtra carbon* ..... 20¢
gular carbon* ..... 17¢

Warehouse prices on and east of Mississippi are 2¢ per lb higher; west of Mississippi, 4¢ higher.

ELECTRICAL SHEETS

Base, all grades f.o.b. Pittsburgh

	Per lb
mature	4.80¢ to 5.05¢
ectrical	5.30¢ to 5.55¢
otor	6.05¢ to 6.30¢
namo	6.75¢ to 7.50¢
ansformer 72	7.25¢ to 8.25¢
ansformer 65	7.95¢ to 9.20¢
ansformer 58	8.65¢ to 9.90¢
ansformer 52	9.45¢ to 9.70¢

F.o.b. Chicago and Gary: armature rough motor only. F.o.b. Granite City ld to lower quotation 0.45¢ for armature rough & including 72, and 0.35¢ for lance.

RAILS, TRACK SUPPLIES

(F.o.b. mill)

ndard rails, heavier than 60 lb
No. 1 O.H., per 100 lb $2.75
gle splice bars, 100 lb 3.85
o.b. basing points) *per 100 lb*
ht rails (from billets) $3.10

	Base per lb
t spikes	4.85¢
ew spikes	6.90¢
plate, steel	3.65¢
plates, Pittsburg, Calif.	3.80¢
ack bolts	7.00¢
ack bolts, heat treated, to railroads	7.25¢

Basing points, light rails, Pittsburgh, mingham; cut spikes and tie plates—tsburgh, Chicago, St. Louis, Kansas y, Minnequa, Colo.; Birmingham; tie es alone—Steelton, Pa., Buffalo. Cut es alone—Youngstown, Lebanon, Pa.; hmond.

ROOFING TERNEPLATE

(F.o.b. Pittsburgh, 112 sheets)

	20x14 in.	20x28 in.
8-lb coating I.C.	$7.05	$14.10

CLAD STEEL

Base prices, cents per pound

Stainless-clad	Plate	Sheet
No. 304, 20 pct, f.o.b. Pittsburgh, Washington, Coatesville, Pa....	*24.00	*22.00
Nickel-clad 10 pct, f.o.b. Coatesville, Pa.	21.50	....
Inconel-clad 10 pct, f.o.b. Coatesville..	30.00	....
Monel-clad 10 pct, f.o.b. Coatesville..	24.00	....
Aluminized steel Hot dip, 20 gage, f.o.b. Pittsburgh	....	9.00

* Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. Pittsburgh, Chicago Birmingham

	Base	Column San Francisco
Standard & coated nails*	94	115
Galvanized nails*	94	115
Woven wire fence†	100	123
Fence posts, carloads††	105	...
Single loop bale ties....	99	123
Galvanized barbed wire**	113	133
Twisted barbless wire..	113	...

* Also Duluth; Worcester, 6 columns higher. † 15½ gage and heavier. ** On 80-rod spools, in carloads. †† Pittsburgh, Duluth only.

	Base per 100 lb	San Francisco
Annealed fence wire ‡..	$4.20	$5.21
Annealed, galv. fencing ‡	4.65	5.66
Cut nails, carloads ‡‡..	6.30	...

‡ Add 10¢ at Worcester. ‡‡ Pittsburgh only, less 20¢ to jobbers.

HIGH STRENGTH, LOW ALLOY STEELS

base prices, cents per pound

Steel	Alde-cor	Corten	Double Strength No. 1	Dyn-alloy	HI Steel	Mayari R	Otis-coloy	Yoloy	NAX High Tensile
Producer	Republic	Carnegie-Illinois, Republic	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngstown Sheet & Tube	Great Lakes Steel
Plates.....	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55	4.55
Sheets									
Hot-rolled...	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30	4.30
Cold-rolled...	5.30	5.30	5.30	....	5.30	5.30	5.30	5.30	5.30
Galvanized...		6.00	....	....	....	6.00	....	....	
Strip									
Hot-rolled...	4.30	4.30	4.30	....	4.30	4.30	4.30	4.30	4.30
Cold-rolled...	....	....	5.30	....	....	5.30	5.30	5.30	5.30†
Shapes.....	....	4.30	....	....	4.30	4.30	4.30	4.30	....
Beams.....	....	4.30	....	....	....	4.30	....	....	....
Bars									
Hot-rolled...	4.45	4.45	4.45	....	....	4.45	4.45	4.45	4.45
Bar shapes.....	....	4.45	....	....	4.45	4.45	4.45	4.45	....

† Pittsburgh, add 0.10¢ at Chicago and Gary.

PIPE AND TUBING

Base discounts, f.o.b. Pittsburgh and Lorain, steel buttweld and seamless. Others f.o.b. Pittsburgh only
Base price, $200.00 per net ton

Standard, threaded & coupled

Steel, buttweld	Black	Galv.
½-in.	47	29½
¾-in.	50	33½
1-in.	52½	36½
1¼-in.	53	37
1½-in.	53½	37½
2-in.	54	38
2½ and 3-in.	54½	38½
Wrought Iron, buttweld		
½-in.	+11	+35
¾-in.	+ 1½	+25
1 and 1¼-in.	4	+16½
1½-in.	9½	+13
2-in.	10	+12½
Steel, lapweld		
2-in.	44½	28
2½ and 3-in.	48½	32
3½ to 6-in.	50½	34
Steel, seamless		
2-in.	43½	27
2½ and 3-in.	46½	30
3½ to 6-in.	48½	32
Wrought Iron, lapweld		
2-in.	1½	+20
2½ to 3½-in.	4	+16
4-in.	8	+10½
4½ to 8-in.	6	+12

Extra Strong, plain ends

Steel, buttweld		
½-in.	46	30
¾-in.	50	34
1-in.	52	37
1¼-in.	52½	37½
1½-in.	53	38
2-in.	53½	38½
2½ and 3-in.	54	39
Wrought Iron, buttweld		
½-in.	+ 6½	+29
¾-in.	+ ½	+23
1 and 1¼ in.	4	+16½
2-in.	10	+12½
Steel, lapweld		
2-in.	43½	28
2½ and 3-in.	48½	33
3½ to 6-in.	52	36½
Steel, seamless		
2-in.	42½	27
2½ and 3-in.	46½	31
3½ and 6-in.	50	34½
Wrought Iron, lapweld		
2-in.	4½	+16½
2½ to 4-in.	13	+ 6
4½ to 6-in.	9	+10½

Basing discounts for standard pipe are for threads and couplings. For threads only, buttweld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, buttweld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3½-in. and larger four points higher discount (lower price) applies. F.o.b. Gary prices are one point lower discount on all buttweld. On buttweld and lapweld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Net base prices per 100 ft, f.o.b. Pittsburgh in carload lots, cut length 4 to 24 ft, inclusive.

OD in In.	Gage BWG	Seamless Hot-Rolled	Seamless Cold-Drawn	Electric Weld Hot-Rolled	Electric Weld Cold-Drawn
2	13	$17.84	$20.99	$17.30	$20.36
2½	12	23.99	28.21	23.27	27.36
3	12	26.68	31.40	25.88	30.46
3½	11	33.35	39.26	32.35	38.08
4	10	41.40	48.70	40.16	47.24

CAST IRON WATER PIPE

Per net ton

4-in. to 24-in. del'd Chicago $91.12
6-in. to 24-in. del'd New York 89.18
6-in. to 24-in., Birmingham 79.50
8-in. and larger, f.o.b. cars, San Francisco, Los Angeles for all rail shipment; rail and water shipment less 105.90
Class "A" and gas pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

Machine and Carriage Bolts

Percent Off List

½ in. & smaller x 6 in. & shorter... 45
9/16 & ⅝ in. x 6 in. & shorter..... 46
¾ in. & larger x 6 in. & shorter..... 43
All diam, longer than 6 in. 41
Lag, all diam over 6 in. long..... 44
Lag, all diam x 6 in. & shorter..... 46
Plow bolts 54

Nuts, Cold Punched or Hot Pressed

(Hexagon or Square)

½ in. and smaller 43
9/16 to 1 in. inclusive 42
1⅛ to 1½ in. inclusive 40
1⅝ in. and larger 35

On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.

Semifin. Hexagon Nuts	USS	SAE
7/16 in. and smaller	..	46
½ in. and smaller	44	..
½ in. through 1 in.	..	44
9/16 in. through 1 in. ...	43	..
1⅛ in. through 1⅛ in. ..	41	42
1⅝ in. and larger	35	..

In full case lots, 15 pct additional discount. For 200 lb or more, freight allowed up to 50¢ per 100 lb, based on Cleveland, Chicago, Pittsburgh.

Stove Bolts

Packages, nuts separate .....65 and 10
In bulk 75

On stove bolts freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago, New York on lots of 200 lb or over.

Large Rivets *(½ in. and larger)*
Base per 100 lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham $5.65
F.o.b. Lebanon, Pa. 5.80

Small Rivets *(7/16 in. and smaller)*
Percent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham 55

Cap and Set Screws
(In packages) *Percent Off List*

Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright 53
¾ to 1 in. x 6 in., SAE 1035, heat treated 44
Set screws, oval points 56
Milled studs 29
Flat head cap screws, listed sizes... 16
Fillister head cap, listed sizes 37

Freight allowed up to 65¢ per 100 lb based on Cleveland, Chicago or New York on lots of 200 lb or over.

FLUORSPAR

Metallurgical grade, f.o.b. producing plant.

Effective CaF_2 Content:	Base price per short ton
70% or more	$35.00
65% but less than 70%	34.00
60% but less than 65%.....	33.00
Less than 60%	32.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

Per Gross Ton

Old range, bessemer..... $6.60
Old range, nonbessemer..... 6.45
Mesabi, bessemer 6.35
Mesabi, nonbessemer 6.20
High phosphorus 6.20
Prices effective for 1948 season.

METAL POWDER

Prices in cents per pound in ton lot, f.o.b. shipping point.

Brass, minus 100 mesh .....24¢ to 28½
Copper, electrolytic, 100 and 325 mesh .....30⅝¢ to 34⅝
Copper, reduced, 150 and 200 mesh .....30½¢ to 32
Iron, commercial, 100, 200, 325, mesh 96 + % Fe carlots..11.5¢ to 14.5
Swedish sponge iron, 100 mesh, c.i.f. N. Y., carlots, ocean bags..7.4¢ to 8.5
Domestic sponge iron, minus 48 mesh 10
Iron, crushed, 200 mesh and finer, 90 + % Fe carload lots 5
Iron, hydrogen reduced, minus 80 mesh, 98 + % Fe..... 11.00
Iron, hydrogen reduced, 300 mesh and finer, 98 + % Fe, drum lots .....63¢ to 80
Iron, electrolytic, unannealed, 325 mesh and coarser, 99 + % Fe.. 44
Iron, electrolytic, annealed, 100, minus 200 mesh, 99.5 + % Fe .....19.5¢ to 23.5
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe..... 39½
Iron carbonyl, 300 mesh and finer, 98-99.8 + % Fe .....90¢ to $1.7
Aluminum, 100, 200 mesh, carlots .....23¢ to 29
Antimony, 100 mesh 44
Cadmium, 100 mesh $2.0
Chromium, 100 mesh and finer... $1.02
Lead, 100, 200 & 300 mesh 20½¢ to 25½
Manganese, minus 325 mesh and coarser 59
Nickel, 100 mesh 51½
Silicon, 100 mesh 29
Solder powder, 100 mesh..8½¢ plus meta
Stainless steel, 302, minus 100 mesh 75
Tin, 100 mesh 90
Tungsten metal powder, 98%-99%, any quantity, per lb..... $2.9
Molybdenum powder, 99%, in 100-lb kegs, f.o.b. York, Pa., per lb.. $2.6
Under 100 lb $2.9

COKE

Furnace, beehive (f.o.b. oven) Net Ton
Connellsville, Pa. .....$12.00 to $13.0
Foundry, beehive (f.o.b. oven)
Connellsville, Pa. ..... 13.50 to 14.5
Foundry, Byproduct
Chicago, del'd $18.60
Chicago, f.o.b. 17.50
New England, del'd 20.40
Seaboard, Kearney, N. J., f.o.b.. 17.85
Philadelphia, f.o.b. 17.75
Swedeland, Pa., f.o.b. 17.75
Buffalo, del'd 20.15
Ashland, Ohio, f.o.b. 15.50
Painesville, Ohio, f.o.b. 16.60
Erie, del'd 19.95
Cleveland, del'd 17.90
Cincinnati, del'd 18.59
St. Louis, del'd 18.03
Birmingham, del'd 15.76

REFRACTORIES

(F.o.b. Works)

Fire Clay Brick *Carloads, Per 100*

No. 1 Ohio $67.0
First quality, Pa., Md., Ky., Mo., Ohio 73.0
First quality, New Jersey 78.0
Sec. quality, Pa., Md., Ky., Mo., Ohio 67.0
Sec. quality, New Jersey 70.0
No. 2 Ohio 59.0
Ground fire clay, net ton, bulk 10.5

Silica Brick

Pennsylvania and Birmingham $73.0
Chicago District and Alabama 82.0
Silica cement, net ton (Eastern) .. 12.5
East Chicago 13.5

Chrome Brick *Per Net To*

Standard chemically bonded, Balt., Plymouth Meeting, Chester $64.0

Magnesite Brick

Standard, Balt. and Chester $86.0
Chemically bonded, Baltimore 75.0

Grain Magnesite
std. ⅝-in. grains

Domestic, f.o.b. Balt. and Chester in bulk, fines removed $51.5
Domestic, f.o.b. Chewelah, Wash., in bulk with fines 27.0
in sacks with fines 31.5

Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk. Midwest, add 10¢: Missouri Valley, add 30¢ $11.0

WAREHOUSE PRICES

Base prices, delivered metropolitan areas, per 100 lb.

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled		Standard Structural	Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
iladelphia	$4.58	$5.77	$5.90	$4.82	$5.90	$4.85	$4.57	$4.87	$5.75	$8.47	$8.77	$10.30	$10.45
w York	4.76	5.76[1]	6.16	5.08	6.08	5.11	4.80	5.08	5.80	8.68	8.83	10.35	10.50
ston	4.83	5.69	6.23[12]	5.61	6.87	5.18	4.91	5.04	5.88	8.99	9.14	10.43	10.58
ltimore	4.32	....	5.72	4.80	....	4.77	4.71	4.85	5.71	....	....	....	....
rfolk	4.90	....	....	5.30	....	5.15	5.15	5.20	6.00	....	....	....	....
icago	4.25	5.10	5.65	4.35	5.45-6.65	4.60	4.40	4.46	5.10	8.20	8.35	9.80	9.65
lwaukee	4.458	5.308	5.858	5.058	5.858	4.808	4.608	4.608	5.395	8.645	8.795	9.945	10.095
veland	4.25	5.10[1]	5.82	5.05	....	4.60†	4.70	4.40	5.10	8.61	8.76	9.50	9.85
ffalo	4.25	5.10	6.03	5.23	5.72[5]	4.98	4.40	4.40‡	5.10	8.20	8.35	9.50	9.65
troit	4.41	5.28	6.07	4.77	5.67	4.9-††	4.82	4.58-4.62	5.26	8.82	8.97	10.09	10.24
ncinnati	4.56	5.22	5.77	4.77	....	4.98	4.82	4.78	5.63	....	....	....	....
Louis	4.61	5.48	6.22	4.71	6.02	4.96	4.78	4.76	5.67	8.92	9.07	10.22	10.37
tsburgh	4.25	5.10[1]	5.65	4.35	....	4.60	4.40	4.40	5.10	8.20	8.35	9.50	9.65
Paul	4.68	5.53	6.08	4.78	....	5.03	4.83	4.83	6.00	....	....	....	....
naha	5.262	....	6.712	5.362	....	5.612	5.412	5.412	6.112	....	....	....	....
lianapolis	4.55	5.38	5.93	4.65	5.95	4.90	4.70	4.70	5.57	....	....	....	....
mingham	4.45[11]	....	5.80	4.45[11]	....	4.65[11]	4.40[11]	4.40[11]	6.13	....	....	....	....
mphis	4.88[11]	5.94[1]	6.43	5.08[11]	....	5.23[11]	5.03[11]	5.03[11]	5.94	....	....	....	....
w Orleans	*5.05[11]	6.39[1]	....	5.25[11]	....	5.40[11]	*5.10[11]	*5.20[11]	6.39[6]	....	....	....	....
uston	5.55	....	7.05	5.65	....	5.90	5.70	5.70	7.00	9.40	9.25	10.40	10.55
s Angeles	5.75	7.35[1]	7.40	6.05	8.70[5]	5.55	5.35	5.50	7.35[14]	9.79[15]	9.55[10]	11.15[15]	11.30[15]
n Francisco	5.40[8]	6.65	7.05	5.75[8]	8.70	5.50	5.30	5.05	7.50	9.70[15]	9.55[15]	11.15[15]	11.30[15]
attle	5.45[4]	7.25[2]	7.10	5.60[4]	....	5.90	5.25[4]	5.45[4]	7.45[14]	....	8.95[16]	....	11.30[15]
rtland	5.45[4]	7.25[2]	7.10	5.85[4]	....	5.70[4]	5.40[4]	5.55[4]	7.45[14]	....	8.95[15]	....	11.30[15]
t Lake City	6.40	....	7.85	6.70	....	6.20	6.35	6.55	7.55	....	....	....	....

BASE QUANTITIES

Standard unless otherwise keyed on ices.

HOT-ROLLED: Sheets, strip, plates, shapes d bars, 400 to 1999 lb.

COLD-ROLLED: Sheets, 400 to 1999 lb; strip, extras on all quantities; bars 1000 lb and over.

ALLOY BARS: 1000 to 1999 lb.

GALVANIZED SHEETS: 450 to 1499 lb.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 500 to 1999 lb; (10) 500 to 999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) up to 1999 lb.

* Add 46¢ for sizes not rolled in Birmingham

† Up to ¾ in. thick and 90 in. wide.

‡ Add 38¢ for sizes not rolled at Buffalo.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight.

BASING POINT* PRICES						DELIVERED PRICES† (BASE GRADES)							
Basing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Basing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
thlehem	40.00	40.50	41.00	41.50	.....	Boston	Everett	$0.50 Arb.	.....	45.50	46.00	.....	.....
rmingham	38.88	38.38-39.38	.....	.....	.....	Boston	Steelton	6.78	45.78	.....	.....	.....	51.78
ffalo	40.00-41.88*	40.00-42.38*	40.50 42.88*	.....	.....	Brooklyn	Bethlehem	3.60	43.60	44.10	44.60	45.10	.....
						Cincinnati	Birmingham	5.85	44.73	42.23-45.23	.....	.....	.....
icago	38.50	39.00	39.50	40.00	.....	Jersey City	Bethlehem	2.21	42.21	42.71	43.21	43.71	.....
veland	38.50-39.75*	39.00-40.25*	39.50-40.75*	.....	.....	Los Angeles	Provo	7.13	46.13	46.63	.....	.....	.....
						Mansfield	Cleveland-Toledo	2.56	41.06-42.31*	41.56-42.81*	42.06 43.31*	42.56	.....
luth	39.00	39.50	40.00	40.50	.....								
e	38.50	39.00	39.50	40.00	.....	Philadelphia	Bethlehem	2.00	42.00	42.50	43.00	43.50	.....
erett		45.00	45.50	.....	.....	Philadelphia	Swedeland	1.21	46.21	46.71	47.21	47.71	.....
anite City	39.50	40.00	40.50	.....	.....	Philadelphia	Steelton	2.59	42.59	.....	.....	.....	48.59
ville Island	39.00	39.50	39.50	40.00	.....	San Francisco	Provo	7.13	46.13	46.63	.....	.....	.....
wo	39.00	39.50	.....	.....	.....	Seattle	Provo	7.13	46.13	46.63	.....	.....	.....
arpsville	39.00	39.50	39.50	40.00	.....	St. Louis	Granite City	0.75 Arb.	40.25	40.75	41.25	.....	.....
elton	40.00	.....	.....	.....	46.00								
uthers, Ohio	39.50	.....	.....	.....	.....								
edeland	45.00	45.50	46.00	46.50	.....								
ledo	38.50	39.00	39.50	40.00	.....								
by, N. Y.	.....	.....	.....	.....	46.00								
ungstown	39.00	39.50	39.50	40.00	.....								

* Republic Steel Corp. price. Basis: pig iron at Cleveland and Buffalo set by average price of No. 1 hvy. mlt. steel scrap at Cleveland or Buffalo respectively as shown in last week's issue of THE IRON AGE. Price is effective until next Sunday midnight.

Basing point prices are subject to switch-g charges; silicon differential (not ex-ed 50¢ per ton for each 0.25 pct silicon con-nt in excess of base grade which is 1.75 to 25 pct); phosphorus differentials, a reduc-on of 38¢ per ton for phosphorus content of 70 pct and over; manganese differentials, a arge not to exceed 50¢ per ton for each 50 pct manganese content in excess of 1.00 pct. $2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and $1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.00 to 6.50 pct, C/L per g.t., f.o.b. Jackson, Ohio—$49.50; f.o.b. Buffalo—$50.75. Add $1.25 per ton for each additional 0.50 pct Si, up to 12 pct. Add 50¢ per ton for each 0.50 pct Mn over 1.00 pct. Add $1.00 per ton for 0.75 pct or more P. Bessemer ferrosilicon prices are $1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus $55.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, $62.46. High phosphorus charcoal pig iron is not being produced.

Ferromanganese

78-82% Mn, Maximum contract base price, gross ton, lump size, f.o.b. Baltimore, Philadelphia, New York, Birmingham, Rockwood, Tenn.

Carload lots (bulk)	$145
Less ton lots (packed)	189.00
Delivered Pittsburgh	151.00

$1.80 for each 1% above 82% Mn; penalty, $1.80 for each 1% below 78%.

Briquets—Cents per pound of briquet, freight allowed, 66% contained Mn.

	Eastern	Central	Western
Carload, bulk	8.70	8.95	9.50
Ton lots	10.30	10.90	12.80
Less ton lots	11.20	11.80	13.70

Spiegeleisen

Contract prices, gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Carloads	$51.00	$52.00
F.o.b. Pittsburg.h.	50.00	51.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, f.o.b. shipping point, freight allowed, eastern zone.

96% min. mn, 0.2% max. C, 1% max. Si, 2% max. Fe.

Carload, bulk	32
L.c.l. lots	34

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.

Carloads	32
Ton lots	34
Less ton lots	36

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, f.o.b. shipping point, freight allowed, eastern zone.

	Carloads	Ton	Less
0.07% max. C. 0.06% P, 90% Mn.	23.00	24.85	26.05
0.10% max. C.	22.50	24.35	25.55
0.15% max. C.	22.00	23.85	25.05
0.30% max. C.	21.50	23.35	24.55
0.50% max. C.	21.00	22.85	24.05
0.75% max. C., 7.00% max. Si.	18.00	19.85	21.05

Silicomanganese

Contract basis, lump size, cents per pound of metal, f.o.b. shipping point, freight allowed, 65-70% Mn, 17-20% Si, 1.5% max. C.

Carload bulk	7.80
Ton lots	9.45
Briquet, contract basis, carlots, bulk freight allowed, per lb of briquet	8.75
Ton lots	10.35
Less ton lots	11.25

Silvery Iron (electric furnace)

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, openhearth $78.00, foundry, $79.00; $78.75 f.o.b. Niagara Falls; $77.50 f.o.b. Jackson, Ohio. Electric furnace silvery iron is not being produced at Jackson. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 per ton for each 0.50 pct Mn over 1 pct.

Silicon Metal

Contract price, cents per pound contained Si, lump size, f.o.b. shipping point, freight allowed, for ton lots packed.

	Eastern	Central	Western
96% Si, 2% Fe..	16.90	17.50	18.10
97% Si, 1% Fe..	17.30	17.90	18.50

Silicon Briquets

Contract price, cents per pound of briquet, bulk, f.o.b. shipping point, freight allowed to destination, 40% Si, 1 lb Si briquets.

	Eastern	Central	Western
Carload, bulk	5.25	5.50	5.70
Ton lots	6.85	7.45	7.75
Less ton lots	7.75	8.35	8.65

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
85% Si	15.50	....	....
50% Si	9.30	9.80	10.00
75% Si	11.80	12.10	12.85
85% Si	13.30	13.60	14.35
90% Si	15.00	15.30	16.00

Ferrochrome (65-72% Cr, 2% max. Si)

Contract prices, cents per pound, contained Cr, lump size in carloads, f.o.b. shipping point, freight allowed.

	Eastern	Central	Western
0.06% C	26.50	26.90	27.00
0.10% C	26.00	26.40	26.50
0.15% C	25.50	25.90	26.00
0.20% C	25.25	25.65	25.75
0.50% C	25.00	25.40	25.50
1.00% C	24.50	24.90	24.75
2.00% C	24.25	24.65	24.75
65-69% Cr, 4.9% C	18.60	19.00	19.15
62-66% Cr. 4-6% C. 6-9% Si.	18.60	19.00	19.15

Briquets — Contract price, cents per pound of briquet, f.o.b. shipping point, freight allowed, 60% chromium.

	Eastern	Central	Western
Carload, bulk	12.50	12.75	12.85
Ton lots	14.00	14.90	15.50
Less ton lots	14.90	15.80	16.40

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 2¢ per lb to regular low carbon ferrochrome price schedule. Add 2¢ for each additional 0.25% N.

S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, f.o.b. shipping point, freight allowed.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

	Eastern	Central	Western
Carload	19.70	20.10	20.25
Ton lots	21.85	23.15	23.95
Less ton lots	23.35	24.65	25.45

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% mn, 1.25% max. C.

	Eastern	Central	Western
Carload	25.00	25.40	25.50
Ton lots	27.30	27.95	29.15
Less ton lots	29.10	29.75	30.95

Chromium Metal

Contract prices, cents per lb, chromium contained carload packed, f.o.b. shipping point freight allowed, 97% min. Cr. 1% max. Fe.

	Eastern	Central	Western
0.20% max. C.	97.00	98.50	99.75
0.50% max. C.	93.00	94.50	95.75
9.00% min. C.	91.50	93.00	94.25

Calcium—Silicon

Contract price per lb of alloy, lump, f.o.b. shipping point, freight allowed.

30-35% Ca, 60-65% Si, 3.00% max. Fe r 28-32% Ca, 60-65% Si, 6.00% max. Fe.

	Eastern	Central	Western
Carloads	16.25	16.75	18.80
Ton lots	19.35	20.10	22.25
Less ton lots	20.85	21.60	23.75

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, f.o.b. shipping point, freight allowed.

16-20% Ca, 14-18% Mn, 53-59% Si.

	Eastern	Central	Western
Carloads	17.50	18.00	20.05
Ton lots	19.80	20.65	22.40
Less ton lots	20.80	21.65	23.40

Calcium Metal

Eastern zone contract prices, cents per pound of metal, f.o.b. shipping point, freight allowed. Add 1.5¢ for central zone; 3.5¢ for western zone.

	Cast Turnings	Distilled
Ton lots	$1.85	$2.70	$3.40
Less ton lots	2.20	3.05	4.20

CMSZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-500% C.

	Eastern	Central	Western
Ton lots	18.00	19.10	21.05
Less ton lots	19.25	20.35	22.30

SMZ

Contract price, cents per pound of alloy, f.o.b. shipping point, freight allowed. 60-65% Si, 5-7% Mn. 5-7% Zr, 20% Fe, ⅛ in. x 12 mesh.

	Eastern	Central	Western
Ton lots	15.75	16.85	18.80
Less ton lots	17.00	18.10	20.05

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, f.o.b. plant Niagara Falls, Washington, Pa., York, Pa., per pound contained W, 5 ton lots, freight allowed	$2.1
Ferrovanadium, 35-55%, contract basis, f.o.b. plant, freight allowances, per pound contained V.	
Openhearth	$2.9
Crucible	3.0
High speed steel (Primos)	3.1
Vanadium pentoxide, 88-92% V_2O_5 contract basis, per pound contained V_2	$1.1
Ferrocolumbium, 50-60%, contract basis, f.o.b. plant, freight allowed, per pound contained Cb	
Ton lots	$2.5
Less ton lots	$2.5
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo.	95
Calcium molybdate, 40-45%, f.o.b. Langeloth, Washington, Pa., per pound contained Mo.	80
Molybdenum oxide briquets, 48-52% Mo, f.o.b. Langeloth, Pa., per pound contained Mo.	80
Molybdenum oxide in cans, f.o.b. Langeloth and Washington, Pa., per pound contained Mo.	80
Ferrotitanium, 40-45%, 0.10% C max., f.o.b. Niagara Falls, N. Y., ton lots, per pound contained Ti	$1.1
Ferrotitanium, 20-25%, 0.10% C max., ton lots, per pound contained Ti	$1.3
Less ton lots	$1.4
High carbon ferrotitanium, 15-20%, 6-8% C, contract basis, f.o.b. Niagara Falls, freight allowed, carloads, per net ton	$142.5
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton	$65.0
Less ton lots	$1.2
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Carload lots	18.40
Zirconium, 12-15%, contract basis, lump, f.o.b. plant, freight allowed, per pound of alloy	
Carload, bulk	6.00
Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	
Carload	6.90
Ton lots	7.40
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Car lots	9.50
Ton lots	10.25

Boron Agents

Contract prices per pound of allo f.o.b. shipping point, freight allowe

Ferroboron, 17.50% min. B, 1.50% ma Si, 0.50% max. Al, 0.50% max. C.

	Eastern	Central	Weste
	$1.20	$1.23	$1.21

Manganese—Boron 75.00% Mn, 15-20 B, 5% max. Fe, 1.50% max. Si, 3.00 max. C.

Ton lots	$1.89	$1.903	$1.935
Less ton lots	2.01	2.023	2.044

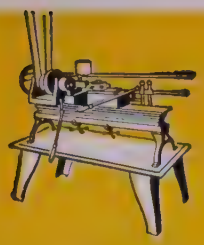
Nickel—Boron 15-18% B, 1.00% max. A 1.50% max. Si, 0.50% max. C, 3.00 max. Fe, balance Ni.

Less ton lots	$1.80	$1.8125	$1.844

Silcaz, contract basis, f.o.b. plant freight allowed, per pound.

Carload lots	39.00

Grainal, f.o.b. Bridgeville, Pa., freight allowed, 50 lb and over.	
No. 1	93
No. 6	62
No. 79	45
Bortram, f.o.b. Niagara Falls	
Ton lots, per pound	45
Less ton lots, per pound	50
Carbortam, f.o.b., Suspension Bridge, N. Y., freight allowed, Ti 15-17%, B 0.90-1.15%, Si 2.5-3.0%, Al 1.0-2.0%.	
Ton lots, per pound	8.0
Borosil, f.o.b. Philo, Ohio, freight allowed, B 3%-4%, Si 40%-45%, per lb contained B	$6.2



The first successful turret lathe and the first Roots Blower were built in the same year . . . 1854. We're not good because we're old, but old because we're good.

See our exhibit at Booths 602 and 604, at Annual Show of American Foundrymen's Association, Philadelphia, May 3rd to 7th.

THE FIRST POUND OF IRON WAS MADE WITH AIR

(Photograph by courtesy of Inland Steel Company, from their motion picture "The Drama of Steel".)

Battery of five big R-C Centrifugal Multi-stage Boosters and Exhausters in a midwestern steel plant.

According to recollection of oldest employees at foundry where this R-C Rotary Positive Blower is installed, it's been giving dependable service for more than 38 years.

For the earliest melting of iron ore, air was supplied by crude, man-power bellows. Today, with a ton of pig iron requiring 2,500 pounds of air, high-capacity, power-driven blowers do the work.

This requires the greatest care in selecting blowers matched to the job. One reason for the frequent specification of Roots-Connersville equipment is our 94-year record for reliable performance.

Another important factor is R-C *dual-ability* to supply either Rotary Positive or Centrifugal units. We are unbiased in our recommendations of whichever type best meets the service demands. Roots-Connersville is the only blower builder giving you this *dual choice.*

For large capacities or for small, built-in applications, as low as 5 CFM, consult R-C *dual-ability* for your blower needs.

ROOTS-CONNERSVILLE BLOWER CORPORATION

842 Ohio Avenue, Connersville, Indiana

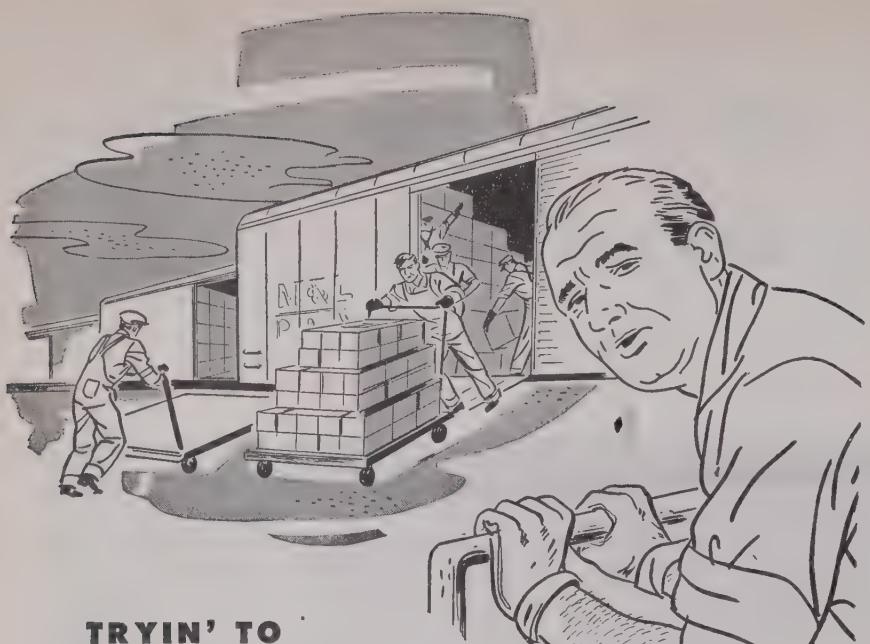
ROOTS-CONNERSVILLE

ROTARY CENTRIFUGAL

BLOWER BUILDERS R-C SINCE 1854

BLOWERS • EXHAUSTERS • BOOSTERS • LIQUID AND VACUUM PUMPS • METERS • LIGHT GAS GENERATORS

★ ★ ONE OF THE DRESSER INDUSTRIES ★ ★



TRYIN' TO ENCOURAGE DEMURRAGE?

It costs money to keep boxcars standing on the siding. And unloading by hand doesn't help a bit. Demurrage can run up a sweet bill before you know it. But, what's more important is to get the goods where they can be turned into a profit . . . fast.

How to do it? Listen. Two men with a few sections of Rapid-Wheel Conveyor and a Rapid Power Booster can unload a car and stack the goods in storage in a couple of hours.

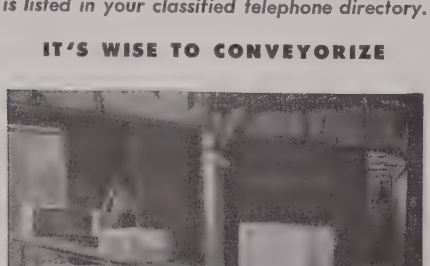
It's wise to conveyorize . . . not only for loading and unloading, but all through the plant. Why not take a good look at your handling costs. Or, let us make an analysis and suggest equipment that will do the job most efficiently and economically. Write us today. There's no obligation.

THE RAPIDS-STANDARD CO., INC.

355 Rapistan Bldg. • Grand Rapids 2, Michigan

Your local Rapids-Standard representative is listed in your classified telephone directory.

IT'S WISE TO CONVEYORIZE



Rapids-Standard

MATERIAL HANDLING EQUIPMENT

Personals

(continued from p. 112)

• **John E. Allen** has been appoint works superintendent at cent furnaces and docks, Cleveland, American Steel & Wire Co., su ceeding **N. B. Clarke,** deceased. M Allen started with the Wire Co. 1937. Since 1945 he has been a sistant division superintende blast furnaces, at Duluth.

• **W. Randolph Burgess,** chairm of the executive committee of t National City Bank of New Yo and **William C. Mullendore,** pre dent of the Southern Californ Edison Co., have been elected to t board of directors of the Uni Pacific R.R. Co., New York.

• **Oscar A. Ahlers** has been elect a vice-president of the Sheffie Corp., Dayton. Mr. Ahlers has be a member of the Sheffield orga ization for 23 years.

• **C. C. Wiley,** heretofore distri sales manager of the Link-Belt C at Birmingham, has been appoint district sales manager at Baltimo **James T. Bell, Jr.** has been a pointed district sales manager Birmingham to succeed Mr. Wil Mr. Bell joined the Link-Belt A lanta plant organization in 1946.

• **Eric S. Ericson** has been a pointed director, **William T. Lare** treasurer, and Justin H. Glide, se retary, of Savary & Glaeser, In Dunellen, N. J.

• **E. R. Godfrey,** vice-president General Motors Corp. and gene manager of the Frigidaire Div., h been appointed group executive charge of the Dayton and hous hold appliance divisions of the co poration, making his headquarte in Detroit. Mr. Godfrey is su ceeded as general manager of t Frigidaire Div. by **Mason Roberts,** who has been facto manager of the division.

• **J. Philip Evans** has been a pointed assistant to S. C. Ogbu Jr., manager of research and d velopment of the Pennsylvania Sa Mfg. Co., Philadelphia. Mr. Eva who joined Pennsalt in 1942, w senior electrical engineer in t company's central engineering di sion at the time of his new appoin ment. **Clifton R. Neumoyer** h been appointed senior resear chemist in the research division

LIFT TRUCKS that LOWER COSTS

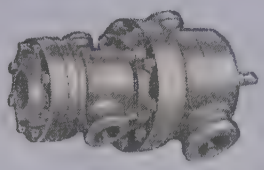
ROSS

Hydraulic LIFT TRUCK

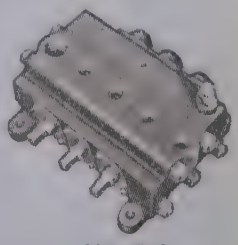
Model 15-HT • Capacity 7½ Tons

USE

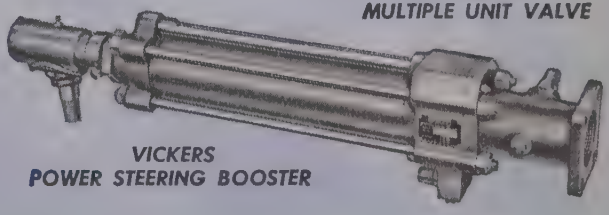
VICKERS HYDRAULIC CONTROLS



VICKERS DOUBLE PUMP



VICKERS MULTIPLE UNIT VALVE



VICKERS POWER STEERING BOOSTER

The Ross Model 15-HT Lift Truck shown above is an excellent example of how Vickers Hydraulic Equipment can be used to help reduce materials handling costs. The cylinder that elevates the 7½ ton load at 35 ft per min gets its power from the Vickers Balanced Vane Type Pump . . . as does the tilt unit cylinder. Single lever and simultaneous control is provided by a Vickers Multiple Unit Double-Acting Valve . . . the valve spool construction assures finger tip control regardless of operating pressure; positioning is accurate, quick and easy. An integral relief valve automatically protects the hydraulic system against damage by overload.

This Ross Lift Truck has greater close quarter maneuverability because it is equipped with Vickers Hydraulic Power Steering. Effortless steering is a certainty as the power required for steering is provided by the Vickers Balanced Vane Type Pump. Adequate power is instantaneously available to meet any requirement. Safety in steering is assured as no reaction to the steering wheel is possible when bumps, chuckholes, etc., are encountered. Trucks handle more easily, more speedily, and with less operator fatigue.

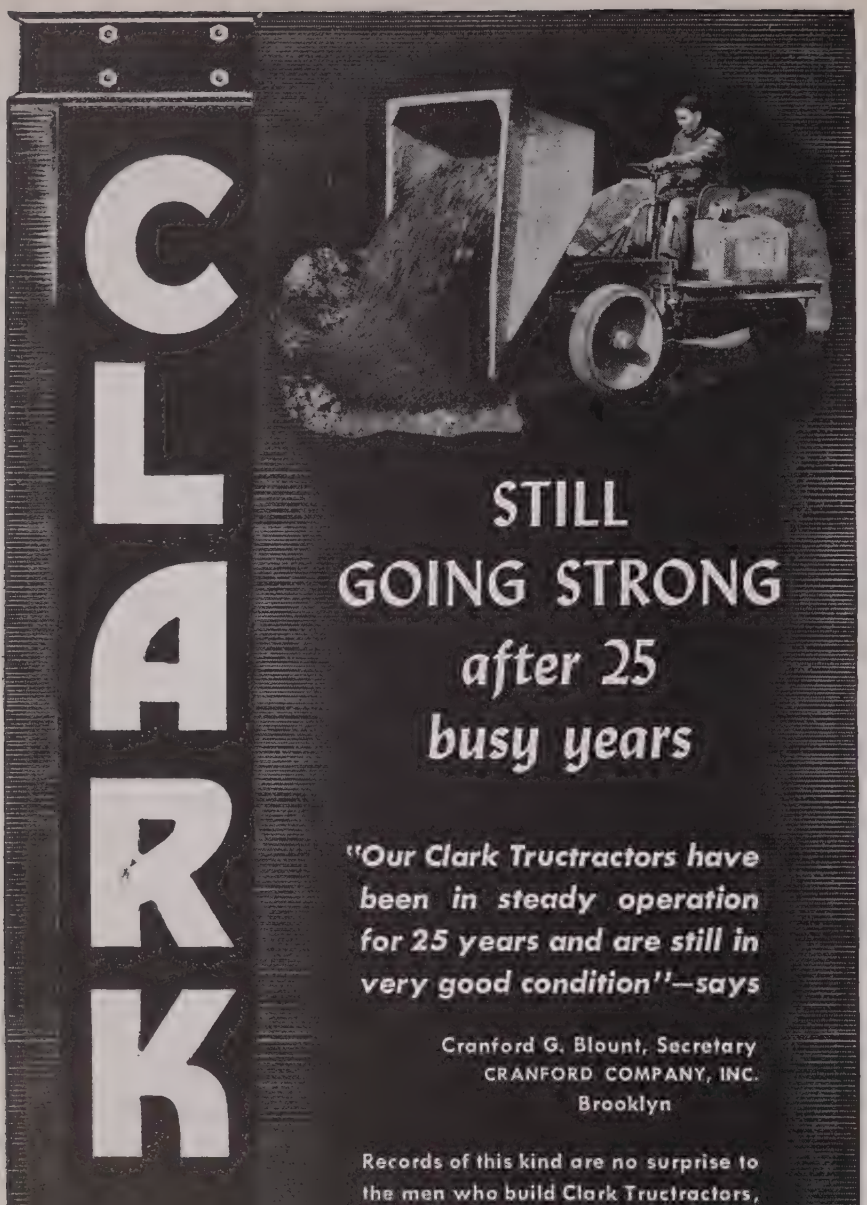
For further information regarding the versatility and other advantages of these Vickers units, ask for the following bulletins: Vickers Vane Type Pumps . . . Bulletin 36-12; Vickers Multiple Unit Valves . . . Bulletin 40-13; Vickers Power Steering Booster . . . Bulletin 47-30. 3437

VICKERS Incorporated • 1420 OAKMAN BLVD. • DETROIT 32, MICHIGAN

DIVISION OF THE SPERRY CORPORATION

lication Engineering Offices:—ATLANTA • CHICAGO • CINCINNATI • CLEVELAND • DETROIT • LOS ANGELES • NEWARK
ADELPHIA • PITTSBURGH • ROCHESTER • ROCKFORD • ST. LOUIS • SEATTLE • TULSA • WASHINGTON • WORCESTER

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT FOR 27 YEARS



CLARK ELECTRIC AND GAS POWERED FORK TRUCKS AND INDUSTRIAL TOWING TRACTORS

CLARK EQUIPMENT COMPANY, TRUCTRACTOR DIVISION, BATTLE CREEK 51, MICH.
REPRESENTATIVES IN PRINCIPAL CITIES THROUGHOUT THE WORLD

Pennsalt. He comes to the company from the Heyden Chemical Corp. **Harold L. Warner,** previously associated with Watson, Cole Grindle & Watson, has been made associate patent attorney, patent division. **Joseph Simkin** has been appointed research chemist, special products division of Pennsalt. He was previously associated with the research section, industrial test laboratory, at the Philadelphia Naval Base. **Charles A. P. von-Hemert** has been appointed junior chemical engineer, development division.

• **Henry R. Greenley** has been appointed manager of the newly-formed Morse-Formsprag sales department of the Morse Chain Co., Ithaca, N. Y. He will retain his duties as manager for the present Morse coupling department.

• **John L. Perkins, III,** has been appointed vice-president and general sales manager of B. F. Perkins & Son, Inc., Holyoke, Mass.

• **W. M. Myler,** assistant treasurer of Rockwell Mfg. Co., Pittsburgh, has retired after serving the firm for 46 years.

• **L. C. Watson,** formerly with Trumbull Mfg. Co., has been appointed sales manager of distributor sales of the Allen-Bradley Co., Milwaukee.

• **William J. Hammond** has been elected vice-president of the Purdy Co., Chicago. He was formerly vice-president in charge of railroad sales for Inland Steel Co.

• **James W. Kelley** has been assigned to the sales engineering staff of the Tulsa office of Vickers Inc., Detroit. Mr. Kelley has been in production, engineering and sales work at Vickers since 1946. **Fred V. Gieryn,** who has been in sales engineering at Vickers since 1945 is manager of the Rochester office.

• **Robert W. Kerr** has been elected a vice-president and director of the Bingham-Herbrand Corp., Toledo. He will be associated with the Herbrand Div. of the organization at Fremont, Ohio. Mr. Kerr had been executive vice-president and sales manager of the Plomb Tool Co. of Los Angeles until recently.

• **Herbert S. Ide, Jr.,** formerly assistant secretary and assistant treasurer of Eaton Mfg. Co., Cleve-

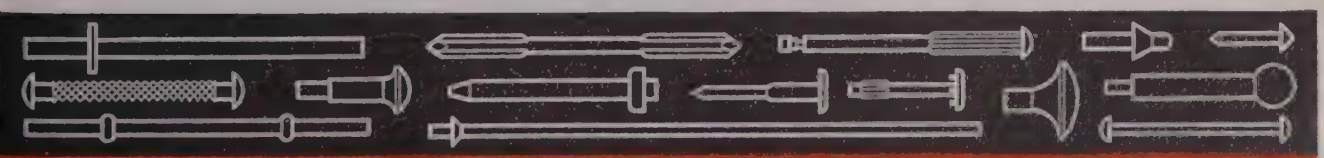
special nails • rivets • screws • made to your order

SPECIAL NAILS · RIVETS · SCREWS · SPECIAL NAILS · RIVETS · SCREWS

Hassall

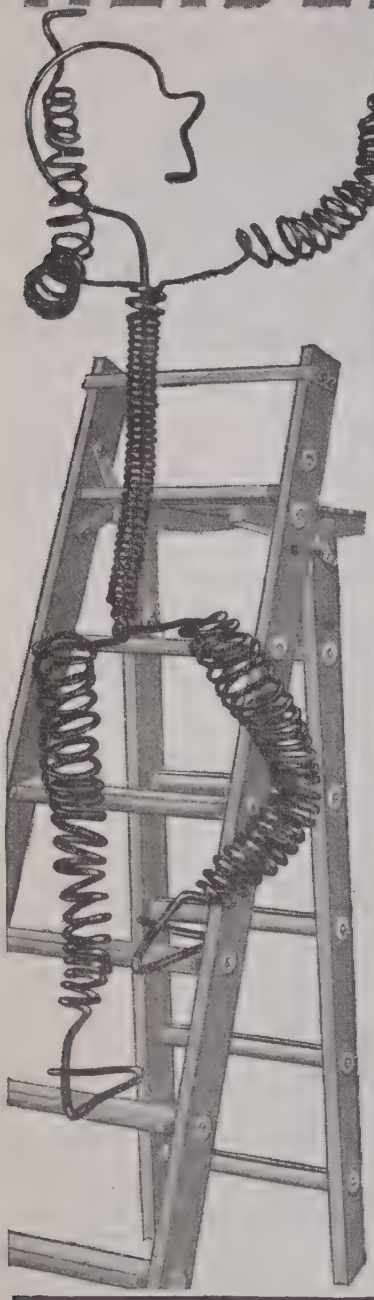
ESTABLISHED 1850

HASSALL cold-heading may solve your immediate special part problem…Special nails, rivets and threaded parts made in diameters from 1/32″ to 3/8″—lengths up to 7″…Rivets 3/32″ diameter and smaller a specialty…Variety of metals, finishes and secondary operations… Economy, quality and quick delivery in large or small quantities…Tell us what you need…We will answer promptly. **ASK FOR FREE CATALOG.** 3-color Decimal Equivalents Wall Chart free on request.



JOHN HASSALL, INC. • 405 OAKLAND STREET • BROOKLYN 22, N. Y.

HEIDER* Ladder Rungs are reinforced with KEYSTONE WIRE



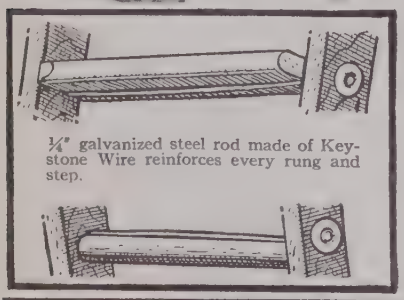
The 2-Way Step and Straight Ladder, is one outstanding example of Heider ladder construction. Every step and rung is reinforced with a ¼" galvanized steel rod made from Keystone Wire . . . greatly increasing the strength under load and giving a wide margin of safety.

An important reason why the Heider people achieve and maintain leadership in their field is the extra care with which they select materials.

Keystone cold-heading wire is the choice of this manufacturer because of its cold upsetting and threading qualities. Controlled manufacturing practices . . . plus rigid mill tests and inspections . . . give Keystone Wire the internal soundness, uniformity of chemical composition and freedom from injurious surface defects necessary for precision manufacturing techniques.

We are indeed proud that Keystone Cold-heading Wire is a recognized factor in the structural soundness of Heider ladders.

** Heider Manufacturing Co. Carroll, Iowa*



¼" galvanized steel rod made of Keystone Wire reinforces every rung and step.

KEYSTONE MUSIC SPRING WIRE

SPECIAL ANALYSIS WIRE for all industrial purposes

KEYSTONE STEEL & WIRE COMPANY
PEORIA 7, ILLINOIS

land, has been named treasurer and assistant secretary of the company. He joined Eaton in 1927.

• **Otto C. Linhart** and **Gordon S. Douglas** have been added to the Chicago Vitreous Enamel Product Co. research laboratories staff, chemical division, Cicero, Ill.

• **Frank M. Sweeny** has been appointed sales representative in the Baltimore district for Iron & Steel Products, Inc., Chicago.

• **Vincent F. Bocklage** has been appointed traveling freight agent, Salt Lake City, Wabash R.R. Co., succeeding **W. T. Bogard**, who has been appointed traveling freight and passenger agent, San Francisco.

• **A. I. Pruett** has been appointed general manager of the Thresher Paint & Varnish Co., Dayton, an affiliate of Pittsburgh Plate Glass Co. Mr. Pruett for more than 25 years was associated with the Pruett-Schaffer Chemical Co., a Pittsburgh concern. He joined the paint division of Pittsburgh Plate in 1946. As general manager of the Dayton company, Mr. Pruett succeeds **Charles L. Sullivan, Jr.**, who died recently after more than 23 years service as president and general manager of Thresher Paint & Varnish.

OBITUARIES

• **Louis A. Fischer,** 93, died Mar. 27. He was one of the founders of the Buffalo Gasolene Motor Co., established in 1898, and served as president for many years.

• **Harry R. Shick,** 63, general manager for the Jackson Iron & Steel Co., Jackson, Ohio, died Mar. 27.

• **Joseph J. Strachan,** general staff manager, sales, Carnegie-Illinois Steel Corp., Pittsburgh, died Apr. 2. He joined U. S. Steel as assistant to the chief engineer of Carnegie-Illinois in 1940.

• **Carlton G. Thornburgh,** former vice-president of R. L. Polk & Co., Detroit, died Mar. 20.

• **W. B. du Mont,** president and director of the du Mont Corp., Greenfield, Mass., died Mar. 22. Mr. du Mont was formerly vice-president in charge of sales and a director of Greenfield Tap & Die Corp. He later became chairman

How a "salt cellar" helps cut your metal cleaning costs

About 1250 feet beneath Pennsalt's Michigan plant lies this high-grade salt deposit. This "cellar" supplies basic raw material for many efficient metal cleaning compounds.

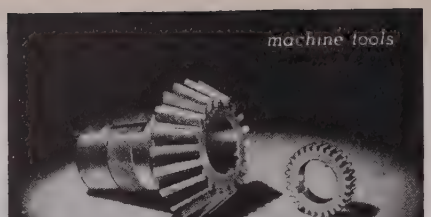
Because Pennsalt owns and operates this and other sources of raw materials, it can manufacture finished cleaners at lower cost . . . and pass the saving along to you in the form of lower price per pound.

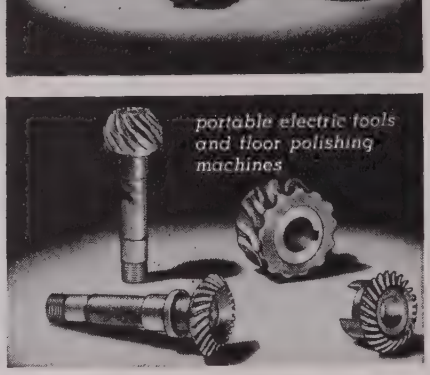
In addition, Pennsalt carefully controls production of its metal cleaners . . . assuring uniform high quality, desirable particle size, correct balance, and superior performance. This adds up to more efficient cleaners . . . and further cleaning economies.

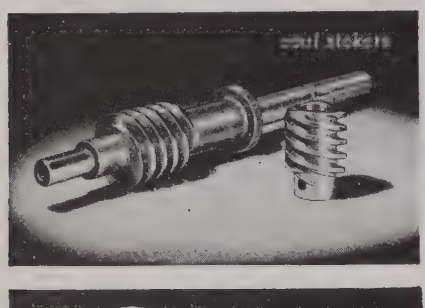
Our staff of technically trained representatives will gladly study your problem and can often make money-saving recommendations . . . without obligation on your part. Just write to Special Chemicals Division, Pennsylvania Salt Manufacturing Company, Philadelphia 7, Pa.

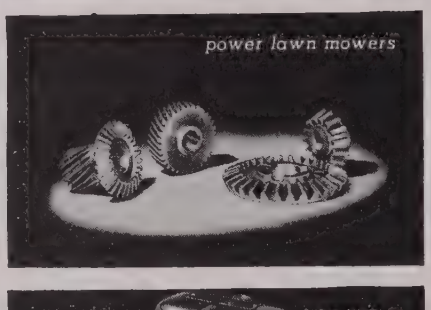
PENN SALT

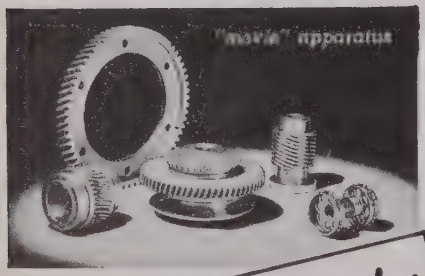
METAL CLEANERS

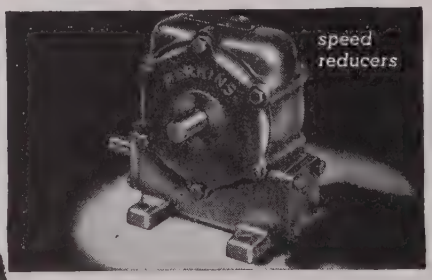












Typical Examples of PERKINS **custom-cut GEARS**

FOR A REPRESENTATIVE NUMBER OF MANUFACTURED PRODUCTS

We have specialized in the mass production of precision gears to customers' specifications for nearly 30 years. Our equipment, facilities and experience enable us to fill orders for any type of gear in any quantity and material—metallic or non-metallic. Once your specifications are in our files, re-orders are filled automatically. Let us quote on your requirements now.

YOU FURNISH THE SPECIFICATIONS — WE'LL PRODUCE THE GEARS

PERKINS Precision, Custom-Cut GEARS

PERKINS MACHINE & GEAR CO., Springfield 2, Mass.

of the board of Threadwell Tap Die Co. when he resigned to fou the du Mont Corp. in 1946.

• **Everard Stubbs,** 66, of the Fello Gear Shaper Co., Springfield, V died Mar. 11. He retired from h duties as factory manager of t company in 1944 due to illness, b continued to act in advisory cap city to the engineering departme as development engineer.

• **David O. Goudie,** district sal manager for Winter Bros., Wren ham, Mass., died recently.

• **Benedict Gifford,** president a general manager of Gifford-Woo Co., Hudson, N. Y., died sudden Mar. 22. Mr. Gifford became secr tary of the company in 1914, the during the following years he w treasurer, vice-president and h been president since 1923.

• **Walter C. Clapp,** 48, manager the product sales department of th Manhattan Rubber Div., Raybe tos-Manhattan, Inc., Passaic, N. died recently. He had been ass ciated with Manhattan Rubber f 34 years.

• **Herbert L. Rawlins,** manager protective devices engineering the switchgear and control divisi of Westinghouse Electric Corp. East Pittsburgh, died recently.

• **Albert C. Burch,** manager of ma ket research for the Thew Shov Co., Lorain, Ohio, since 1938, di recently.

Makes Proposal Changing Record File Regulatio

Washington

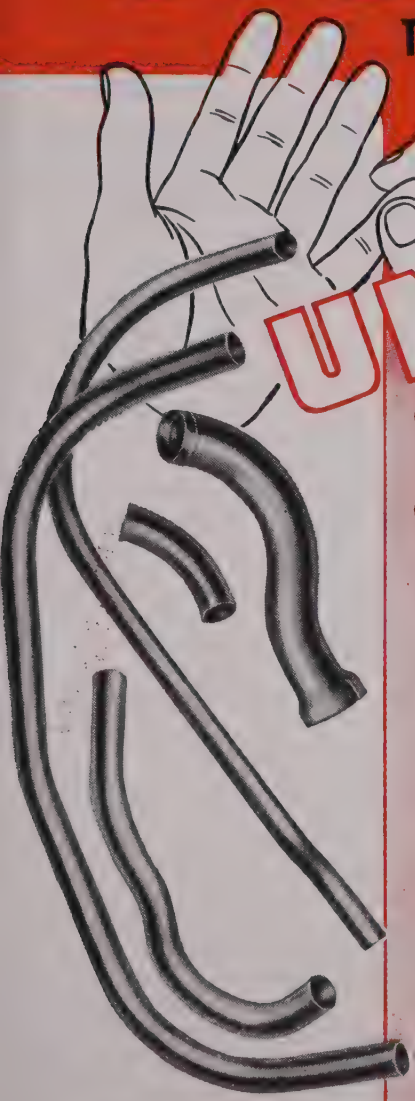
• • • **Notice of a** proposal to amen the record-keeping regulations the Fair Labor Standards Act h been given by W. R. McComb, Wa and Hours Administrator. Inte ested parties have 30 days, begi ning Mar. 8, in which to enter pr tests or other views.

Under the proposed change, tho records which are now required be kept for 4 years would be r tained for only 3. It would car out the new operating policy of t wage-hour division with respect the Portal-to-Portal Act which e tablishes a 2-year statute of lim tations; at the same time, it is keeping with the general statu limiting the time for beginni criminal actions to 3 years.

CHARACTERISTICS of

Michigan WELDED STEEL TUBING

The Modern Electric Resistance Welded Steel Tube



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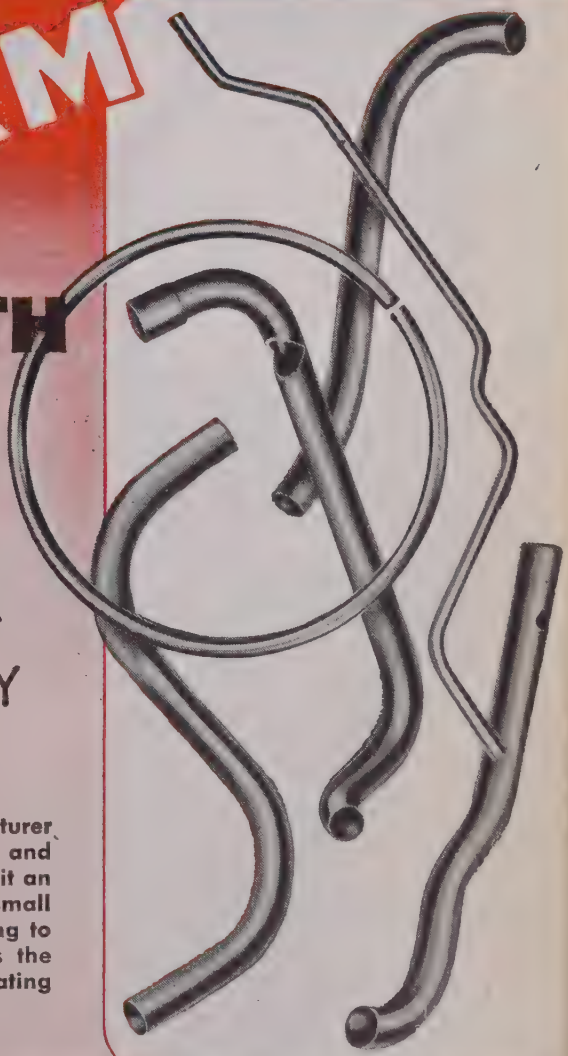

Today — when every manufacturer is seeking shortcuts in production and additional economies that will permit an equitable price reduction, many small shops and large factories are turning to electric resistance welded tubing as the low-cost solution to their fabricating problems.

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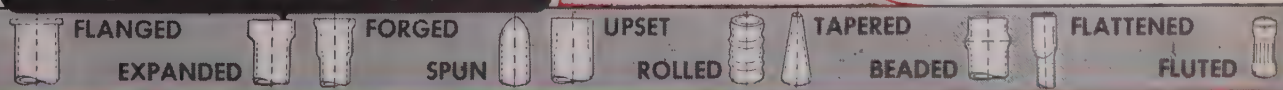

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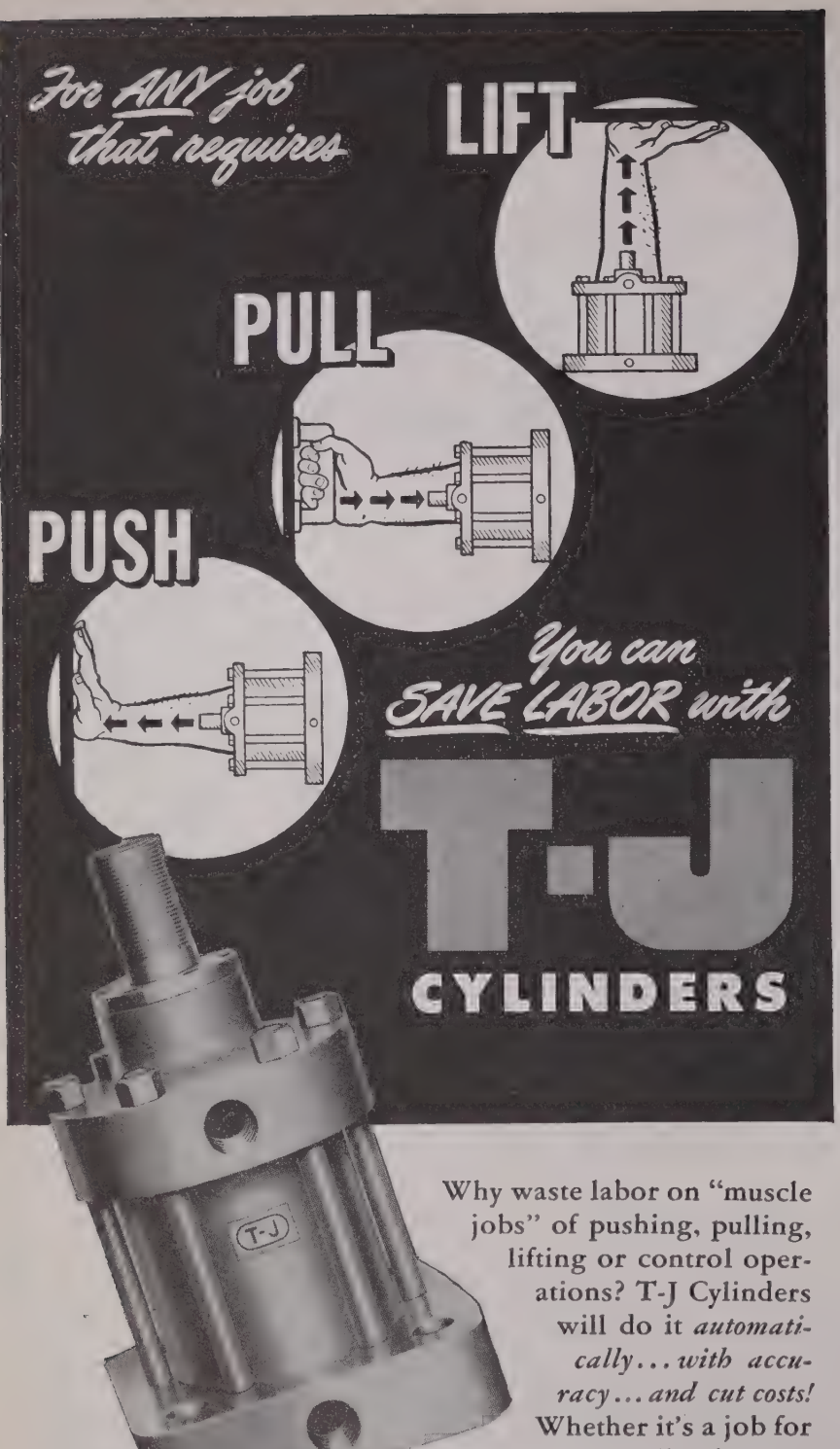

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Titanium Steel, Sought In Pure Form for Jets, Is Used on Range Tops

Pittsburgh

• • • **Titanium steel**—a super metal that scientists are now seeking in a pure form to meet the extreme heats generated by jet plane engines—now is in limited use on the range tops of the 1948 line of Westinghouse electric ranges according to R. M. Beatty, manager of the electric range department of the Westinghouse electric appliance division.

The new steel, which uses a single coat of a special porcelain enamel for its thin, tough, acid resistant, white finish, was developed by Inland Steel Co.

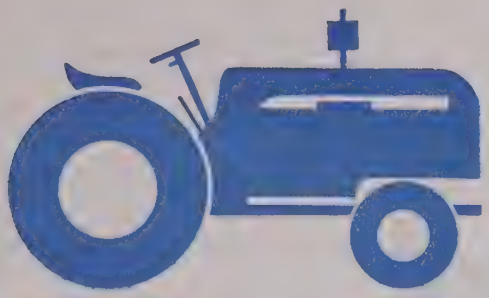
Production of the new titanium steel range tops is now averaging 20 pct of our total range manufacturing, Mr. Beatty reported. As supplies of the new metal and as supplies of the special enamel finish increase the electric appliance division will swing over to 100 pct production of titanium steel range tops. Eventually, they hope to use the new metal for the entire range.

Under current porcelain enameling processes, using vitreous enameling steels, the steel receives three coats—an under cover coat, the porcelain enamel finish coat and an acid resistant coat. According to Westinghouse, with titanium steel, the single coat of the newly developed titanium porcelain is superior to the three coats.

The single coating of titanium porcelain enamel is not only tougher but it is more acid resistant than the present three-coat finish, the department manager said. Present acid resistant coatings should be wiped clean as quickly as possible after an acid solution, such as lemon juice, has been spilled on it. However, with the new titanium steel tops, acid solutions have been left on them for days without any effects of discoloration or etching of the finish.

The titanium steel, now being used on Westinghouse ranges, is a basic open hearth steel which contains enough titanium to combine with the carbon in steel, reducing to a negligible point the high temperature effects of carbon in steel, such as sagging. Steel "sag" is the buckling effect of the metal, under

DO YOU BUILD TRACTORS?



The manufacturer of a nationally-known farm tractor gets plenty of OSTUCO production-assistance that saves time and money on the assembly line. OSTUCO Tubing and these forming and fabricating operations—flattening, bending, swaging, expanding, threading, angle-cutting, beading and punching—eliminate production line delays and worries!

TRICYCLES?

The frame, stem, forks and hubs of this tricycle are fabricated by OSTUCO. Bending, piercing, flattening, reducing, beading and profiling (cutting the end of the tubing in a half-moon shape to fit exactly into another piece of tubing of like size) are the operations that slash production costs at this toy manufacturer's plant!

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Here is an opportunity you can't afford to overlook—an opportunity to improve your product, to produce it in less time and make substantial production savings as well. Experienced OSTUCO engineers and skilled OSTUCO craftsmen, working directly from your own blueprints, can create a finished part or product that will meet your individual requirements, greatly simplifying your production problems and helping make yours a better product.

The possibilities of OSTUCO production-assistance are virtually unlimited . . . the complete story is available, without obligation, at the nearest OSTUCO sales office. Write today . . . learn how OSTUCO Tubing can provide time-saving and cost-cutting assistance on your production job.

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Three OSTUCO operations—tapering, expanding and drilling—performed on OSTUCO Tubing, enable manufacturers of rakes, hoes, forks, shovels and other hand tools to turn out more units per man and per machine. There's a real savings in production costs here, and a far better product as well!

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enameling furnace heats of 1500° 1700° F, Mr. Beatty explained.

While the pure titanium st that scientists are seeking for plane engines will be 100 pct ti nium, metallurgists predict, the tanium steel developed to meet t high temperatures of enameli furnaces contains about 0.5 pct the rare metal.

BNA Survey Indicates Third Round Awaiting Some General Patte

Washington

• • • **Although some** observe claim that the "third round" postwar wage increases has alrea been set at 11¢, there's no eviden to show that any such figure, or a pattern at all has yet appeared, a cording to a study of wage increas released by Bureau of National A fairs, Inc.

The bell for the third round h not yet rung, the survey shows. T Bureau of National Affairs stud covering wage raises granted in co lective bargaining between comp nies and unions throughout t country through March 31, disclos that settlements made so far a mainly on an interim basis.

For example, Young and Green walt Co. in East Chicago, Ind., r cently negotiated a 5¢ per ho increase for workers represented CIO gas, coke and chemical worke The settlement stipulates that e ployees are to receive, in additio any wage increases granted in t steel industry above the 5-cent fi ure. In the meat-packing industr Armour & Co. and Swift & Co. se tled in January with AFL's Me Cutters for 9¢ an hour, but this se tlement is to run only until the co tract expires in August this year.

Both sides are waiting for t heavyweights to get into the ri The third-round pattern, the surv shows, will probably be set in neg tiations between the big unions a a handful of major companies the steel, auto, and electrical equi ment industries.

After the third-round pattern h been decided on by these compani smaller companies in these a other industries are expected to f into line with substantially t same increases.

In 1946, the survey shows, the pa tern was first set in the auto indu try, when Ford and CIO auto wor

settled for 18¢ and Chrysler ed on 18½¢. This was quickly owed by other 18½¢ agreements J. S. Steel, General Motors, Gen- Electric, Westinghouse, and er major producers.

n 1947, the first break came when neral Motors worked out an eement with CIO electrical work- for 11½¢ plus six paid holidays. s formula was immediately ied by other industrial leaders. S. Steel and the steelworkers' on varied slightly with a 12½¢ st and several fringe benefits. wever, in each of the settlements, combination of wage increases l benefits was valued at 15¢.

Here is the timetable for 1948 jor negotiations, as set down in BNA survey: General Motors l Chrysler are already in opening ges of negotiations. United States el wage conferences have begun, ile General Electric and West- house have already been nego- ting for some time.

uch pacesetters as the rubber ustry's Goodyear, Goodrich and S. Rubber buckle down to serious gotiations in May. In the oil in- stry, the major Gulf and Shell on contracts run out in May, and Sinclair contract expires in ne.

Several industries do not follow example of the big heavy manu- turers, however. The textile in- stry particularly has gone its own y. It has granted larger increases, rcentagewise, than the higher- ving heavy industries. Northern ton textile firms, for example, ve granted five separate wage in- ases since V-J Day. The most re- t one, 10 pct in January, makes otal of 42¢ since the end of the r. No further wage review is eduled in the industry until next nuary, however.

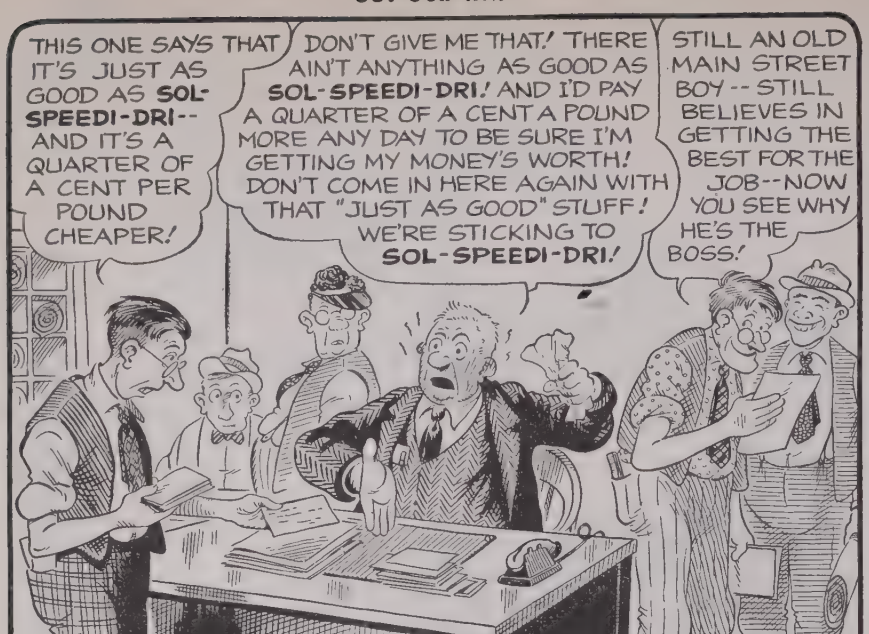
SWA Is Distributing Manual on Grievances

tsburgh

• • **The United Steelworkers** of erica, CIO, is now distributing a nual on grievances to all local ions. It's purpose is to tell some 000 grievance committeemen the portance of their jobs to their ion, what a grievance is and how handle one.

Like a lot of the material coming t of the USWA's publicity and ucation department, it leans avily on applied psychology. It

OUT OUR WAY



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Warehouse Stocks Maintained in Principal Cities of the United States and Canada

contains tips on handling member foremen, management. Vince Sweeney, who heads this depar ment, says the new 32-page bookl is part of the Steelworkers' overa educational program.

The booklet goes into detail c specific cases; advises against ho headedness, suggests ways of har dling matters not covered in th contract and emphasizes the im portance of settling grievances a the first—or foreman—level. Man agement, according to Mr. Sweene may secure copies by writing th publicity and education departmen at union headquarters, 1500 Com monwealth Bldg., Pittsburgh 22.

Borg-Warner Shows Net Profit of $24,523,14

Chicago

• • • **The 1947 annual** report of th Borg-Warner Corp. indicates a pea year in the number of employee total wages, dollar sales and dolla net income. The company whic started as an alliance of four inde pendent automotive parts compa nies in 1928 with a working capita of $6,869,961 has grown to a corpo ration with 21 divisions and a work ing capital of $71,332,191. Th company showed a net profit o $24,523,148 last year.

C. S. Davis, president of the com pany, in discussing the annual re port said that expenditures sinc 1945 for postwar rehabilitation an extension of facilities, have totale $28,975,347. The program is not ye complete, Mr. Davis said, and ma eventually total $37 million. A stee rerolling mill acquired in May 194 at the cost of $782,835 at Franklin Pa., is now being operated as th Franklin Steel Div. of the company Increased demand for automotiv products resulted in an appropria tion last year of $2,850,000 to th Mechanics Universal Joint Div. fo additional plant facilities at Mem phis, Tenn.

Discussing business prospects fo 1948, Mr. Davis said, "The volume o production and sales indicated fo the first 3 months of 1948 is in ex cess of that experienced during th first quarter last year. It is possibl that net income for the first quar ter of this year may not reflect corresponding increase over 194 due to the increased cost of ma terial and labor which has not bee wholly offset by changes in the sel ing price of our products."

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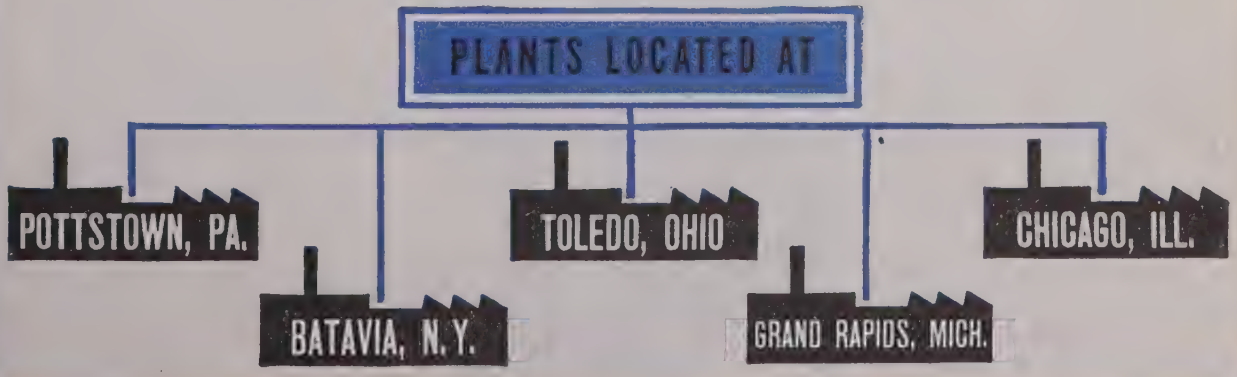

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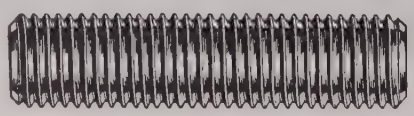

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New Railroad Dock Will Increase Coal Handling Capacity

Toledo, Ohio

• • • **Already one of** the greatest bituminous coal ports in the world, this city will add to its coal movement capacity this year with the formal opening on June 2 of a new railroad dock by the Baltimore & Ohio and the New York Central Railroads.

The dock is the product of 2 years of labor and of an $18 million investment. Through it, each year, the two trunkline rail carriers will be able to move as much as 20 million tons of coal and 4.5 million tons of iron ore.

Located at the mouth of Maumee Bay on Lake Erie, the new dock offers easy access for lake cargo boats in all kinds of weather. The dredging of more than 2.5 million cu yd of mud from the bottom of the naturally protected bay provided a 24-ft deep maneuvering basin with an average length of 2,200 ft and a width of 600 ft. The basin is adjacent to the lake channel, 500 ft wide, thus providing an entrance which presents no difficulties for the largest of lake vessels.

Coal from mines in Ohio, Virginia, West Virginia, Kentucky and Tennessee is transferred at Toledo from the rail hopper cars to the lake boats for over-water movement to Canadian and the westernmost U. S. lake ports. Iron ore, from the Minnesota ranges, is removed from the lake vessels at Toledo for shipment by rail to inland steel plants.

The new dock facilities, when completed, will consist of three coal dumping machines, each capable of picking up and dumping loaded 70-ton coal cars at the rate of one a minute, and two Hulett ore unloaders with a capacity of 30 tons a minute.

At the time of the formal opening, two of the coal dumpers and the two ore unloaders will be in operation. The third coal dumper will be added during the summer months, to complete the facility. The dock will be operated by the Lakefront Dock & Railroad Terminal Co., a subsidiary of the two railroads.

The coal and ore machines required foundations of extreme sturdiness. As a consequence, the 2400-cu yd concrete bed upon which each

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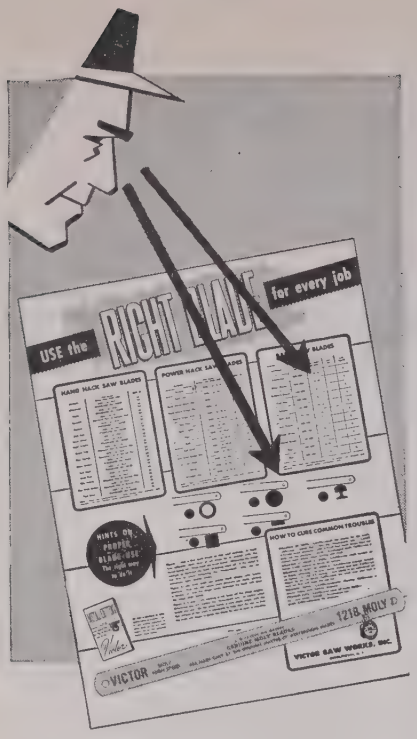

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1600-ton coal machine is placed has a depth of 13 ft and rests atop 515 wooden pilings.

The ore machines, weighing half as much as the coal dumpers, require 8-ft deep concrete foundations, also resting on hundreds of wooden pilings. These foundations are 700 ft long, with tracks atop them to permit the ore machines to move back and forth alongside the vessel.

All of these foundations are reinforced with steel rods. Each foundation was poured in one continuous operation to avoid the fissures that might have resulted had it been poured in layers that hardened at different times. To accomplish this, the men in charge of the concrete pouring were on the job from daybreak until midnight, working under floodlights to complete the job each time a foundation was laid. Much of this concrete pouring was done during sub-zero weather in the winters of 1946-47 and 1947-48.

One of the coal machines, the first to be erected, is entirely new, having been constructed by the Heyl & Patterson Co., Pittsburgh. The other two originally had been located at the New York Central coal pier on the Maumee River in the heart of the city.

The two ore machines were moved from the former B&O ore docks, also on the banks of the Maumee. The machines were transported by barge and rail to the new dock site for modernization and re-erection. Some of the parts of these dismantled machines weighed as much as 138 tons and had to be handled with extreme caution.

The coal dumpers are electrically operated, and all operations are spaced by a system of electrical and mechanical interlocks to assure safe operation. Thus, for example, a loaded car cannot be pushed up the dumper ramp unless the cradle at the top of the ramp is in place. The empty car is pushed from the cradle by the following loaded car, runs down an incline and is carried by its own momentum up the "kick-back" trestle where it comes to a stop and automatically reverses its direction toward the empty yard.

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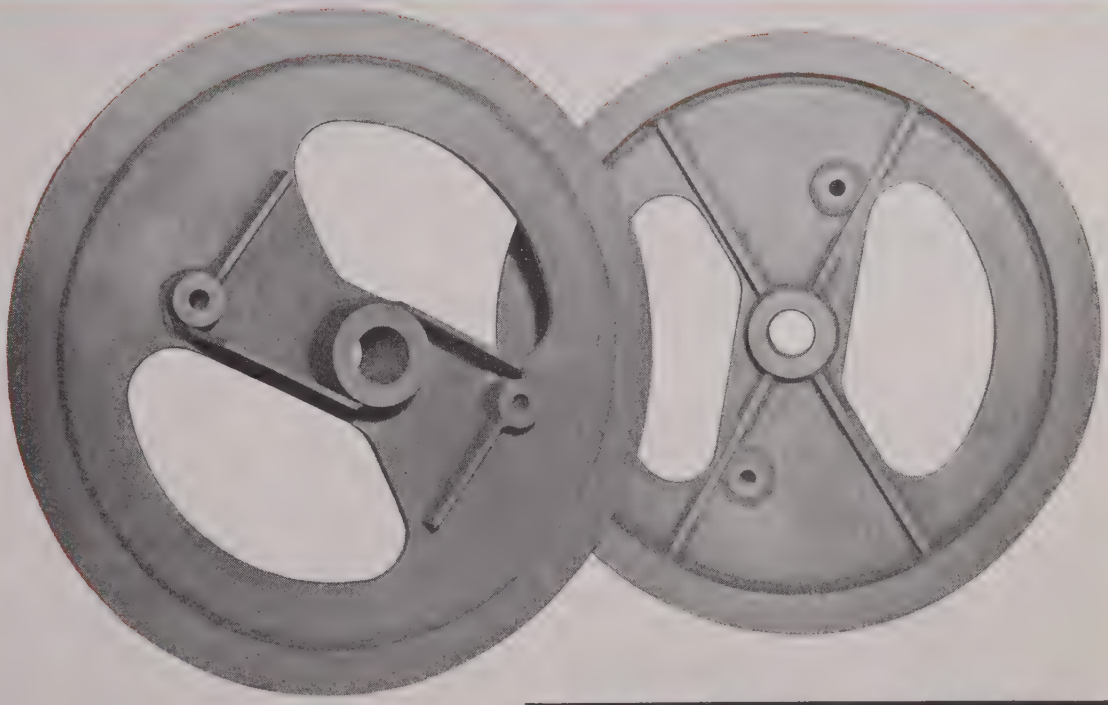

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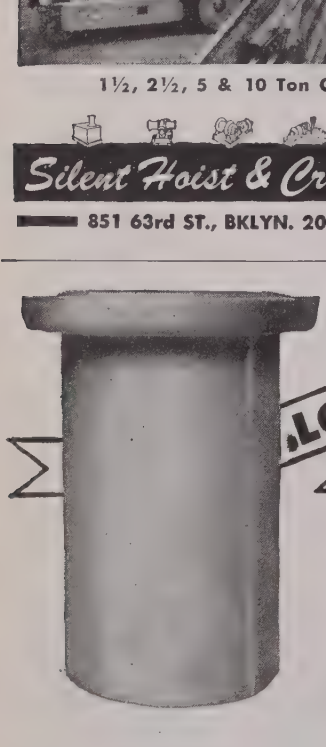

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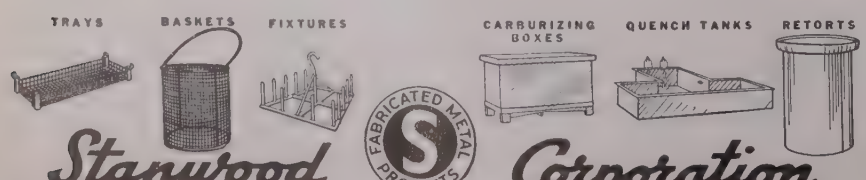

Stanwood Corporation
4827 W. Cortland St. Chicago 39, Ill.

with the city of Toledo's plans for a long-range waterfront improvement program that contemplates the conversion of extensive mud flats into parks, a mooring basin and a small boat basin. The overall construction job was contracted by the Walsh Construction Co. and the Bates & Rogers Construction Corp., contractors.

Bryant Says 90 Pct. Of Machine Tools Are Becoming Obsolescent

Chicago

• • • **American metalworking** plants are suffering from obsolescence because 90 pct of the machine tools used in these plants are of prewar design. A. G. Bryant, president, National Machine Tool Builders' Assn., told members at the NMTBA's 46th spring meeting here.

Mr. Bryant, who is vice-president of Cleereman Machine Tool Co., and president, Bryant Machinery & Engineering Co., said that trouble is not that the lathes, drills, grinders and other power driven machines now in use are rusting out or breaking down, but that machines of obsolete design are reducing industrial efficiency at a time when 1948 models are readily available.

"Even the machine tools installed during the war, which approximately duplicated the number we had in 1939, were largely of designs now obsolete," Mr. Bryant declared.

"**It is safe** to say that the 1948 models of machine tools are, on a weighted average basis, at least one third more productive than those that were built just prior to or during the war," he added.

It is doubtful if the total machine efficiency of America's industrial plant comprising about 1¾ million machine tools can be as much as 65 pct of that obtainable with present day models, according to Mr. Bryant.

"It is a shocking possibility that Russia, because of the newness of her industrial plant, may have an average age of machine tools lower than ours," he pointed out.

Mr. Bryant said the three principal reasons which delay rehabilitation are: "Lack of understanding of the value of the up-to-the-minute machine tools by the 'front office' of industry.

"Difficulty placed in the path of business by the interpretations un-

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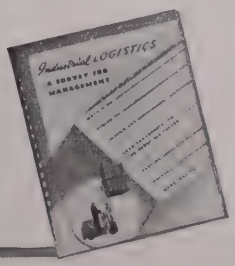
AND, Elwell-Parker does far more than merely supply 47 basic models—it "tailors" them to *your* specific materials handling condition. Already this individual engineering has been profitably applied in *over 300 branches of industry.*

Many basic truck attachments pioneered by Elwell-Parker—such as sideshifting and pushoff devices—are becoming standard throughout the industry. However, E-P trucks still offer many exclusive advantages. *An important example:*—only Elwell-Parker uses Class B motors exclusively. These motors cost more, but are well worth it—they handle 500% overload, are practically indestructible and fire proof.

WHAT DOES ALL THIS ADD UP TO? In durability, engineering experience, versatility, improved design, and services of the EP man on the job, *Elwell-Parker offers you more per dollar invested in industrial power trucks.* THE ELWELL-PARKER ELECTRIC COMPANY, 4225 St. Clair Avenue, Cleveland 14, Ohio.



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der the tax laws of the regulations governing depreciation. The solution is to give industry freedom of choice to permit a concern to depreciate a new machine over five years, if it so elects, so that it can absorb such charges realistically during the time that the machine pays for itself.

"Contraction of venture capital available for capital expenditure. Regulations which require corporations to distribute a large share of current earnings in dividends to stockholders, when the funds so paid out may be needed for rehabilitation or for necessary reserves, ignore the precepts of good management.

"Machine tools today average in sales price only about 50 pct above the 1939 price level. Compare this with the increase in labor rates of over 106 pct, with the increase in farm income of more than 200 pct, and with the increase in wholesale commodity prices of 111 pct, and we get one reason why machine tools today constitute industry's best investment," he declared.

He said a present setback to the machine tool industry is its inability to sell machine tools to Europe because of the restrictions due to political and economic conditions. Throughout the years, foreign sales have comprised about 20 pct of machine tool sales volume.

He recommended that NMTBA members review the policies, organization, and practices which are followed in selling machine tools to the industrial trade, as a step toward greater sales volume.

He said the industry must do a better job in selling the "front office" of industry on the importance of investing in modern machine tools.

"We ask that government act expeditiously in the removal of unsound depreciation barriers which actually limit government income while restricting production and increasing consumers' costs, and that government have an active realization of the place that machine tools have in the sound development of our European Recovery Program, not only to the benefit of rehabilitation in the needy countries, but as a means of conserving American dollars and alleviating shortages of American goods."

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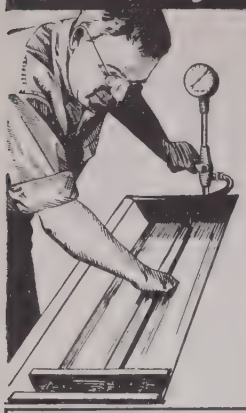

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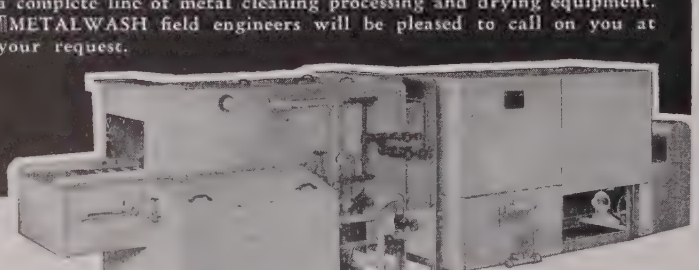

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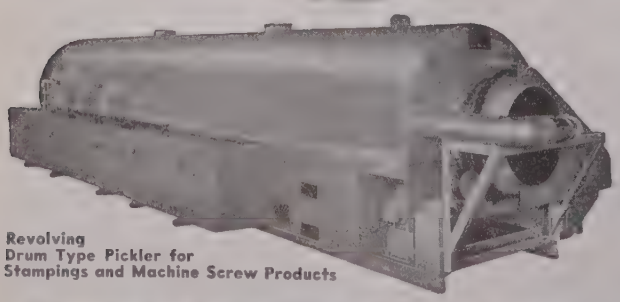

Revolving Drum Type Pickler for Stampings and Machine Screw Products

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3-Year Scholarships In Engineering Offered By Industrial Firm

Cleveland

• • • **National Screw Machi** Products Assn. has announced tw scholarships, valued at $1500 eac which are to be awarded for the yr cooperative course in scre machine engineering at the Roch ester Institute of Technology.

Donors of the two scholarshi are Titan Metal Mfg. Co., Bell fonte, Pa., and D. A. Stuart Oil C and representatives of the tw donor companies will award th successful applicants in Aug. 194

Winners will be chosen by scholarship committee comprisin representatives of the donor com panies and the following member Mark Ellington, president, Roche ter Institute of Technology; Ce E. Lucas, chairman, NSMPA Educa tion Committee; Walter G. Nor trustee of Case Institute of Tech nology and NSMPA member; Howard Spaulding, publishe "Screw Machine Engineering", an Orrin Benson Werntz, NSMPA ex ecutive secretary.

In awarding the scholarship the committee will consider qual ties which make for good citizen ship, leadership, need for assis ance, mechanical aptitude an high school grades. Eligibility fa tors differ slightly for the schola ships, which amount to $500 p year for the 3-yr course.

Titan Metal Mfg. Co.:

(1) Any manufacturer of scre machine product may subm their candidate, provide however that the compan agrees to furnish and gua antees the successful cand date cooperative employme during the period he is R.I.T.

(2) Only contract manufacture are included in the abov because it is felt that capti screw machine departmen of larger companies are nancially able to provide the own employees with a ditional educational facilitie

(3) The candidate must be high school graduate an have graduated not earli than 1946, with a scholast standing in the upper half his class. Application is be accompanied by recor

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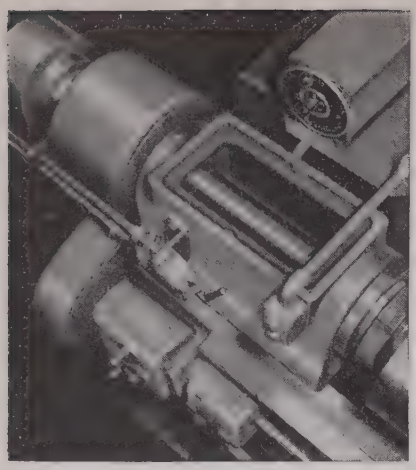


Belt driven headstock contains no gears

NEW MANUFACTURING LATHE PRODUCES AT 2600 RPM

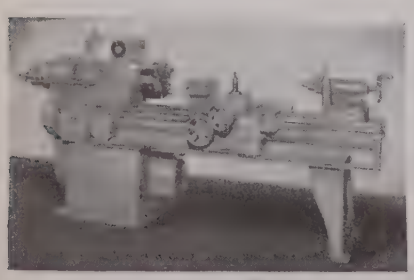
A special purpose manufacturing lathe which operates at 2600 rpm was developed recently by the R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio. The extremely high speed is achieved by means of a single-speed gearless headstock and a direct drive from the 10-hp motor to a special ball bearing mounted spindle.

Four speeds—2600, 1750, 1300, 875 rpm—are obtained through a drum switch.

This new lathe is designed for fast machining of non-ferrous metals where close tolerances and extremely smooth finish are essential. It is equipped with many other rapid production features: belt driven feed, automatic back facing attachment, hardened and ground steel bed ways, and air operated chuck.

Five of these machines—including an 1800-rpm model—were supplied at the request of one customer.

LeBlond special purpose lathes like these represent the most efficient and economical solution to difficult metal turning problems. For information on your requirements, address sales engineering department, the R. K. LeBlond Machine Tool Co., Cincinnati 8, Ohio.



(Advertisement)

mendation from his high school principal.

(4) The candidate must meet the R.I.T. entrance requirements and be acceptable by the school, must have mechanical aptitude, be interested in mechanical trades, and be of good character.

(5) The Committee will select the winner through a series of tests of its own devising, and factors in the selection will also include a short essay of not more than 1,000 words, to be written by the applicant, on why he desires to enter the screw machine products industry.

(6) The scholarship is not available to GI's because at the present time such education is available to them under the GI Bill of Rights.

D. A. Stuart Oil Co.

This company states that the purpose of granting the scholarship is to promote improved screw machine techniques and better understanding of screw machine and metal working problems.

(1) Candidates may be proposed by any manufacturer of screw machine product, or the principal of an accredited high school.

(2) It is a requirement that the student have an agreement with a manufacturer of screw machine product to furnish cooperative employment if the candidate is successful, for the duration of the 3-year course at R.I.T.

(3) Candidate must meet entrance requirements and be acceptable to R.I.T.

(4) Preference will be given to students who are recent high school graduates.

(5) Candidate must be of good moral character, and be interested in the development and promotion of improved screw machine techniques.

(6) Application for scholarship should be accompanied by transcript of high school grades; a resume of extra-curricular activities as well as activities since graduation; and a short statement in the applicant's own handwriting as to why he aspires to become an expert in the screw machine products industry.

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NO matter what your cleaning problem may be—from the simple unpeeling of a thin film of slushing oil to the difficult removal of buffing compound residues and other burned-on mixtures of oil or grease with solid-particle dirt—there is an Oakite cleaning material designed for just that job.

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The twenty types of metals and alloys in common industrial use, the dozen or more major fabricating processes, the two dozen finishing processes and the countless varieties of dirts that adhere to metals, have made metal-cleaning a complicated business.

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For the right answer to that tough metal-cleaning problem, call your Oakite Technical Service Representative today. Let him help you work out a procedure that will produce best results at lowest cost. If you don't have his phone number, just write to:

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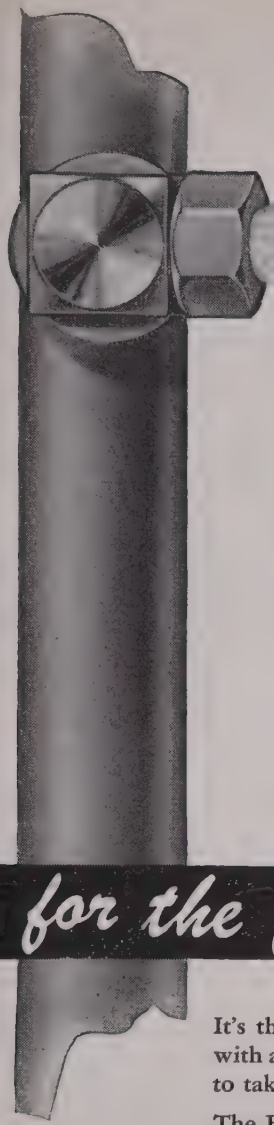

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for the finest paint finishes

PROTECTED BY Bonderite PARKER RUST PROOF CO. FOR CORROSION RESISTANCE

It's the Bonderite spray! Metal parts traveling through it emerge with a close-grained coating of nonmetallic Bonderite crystals, ready to take and *hold* the final paint finish.

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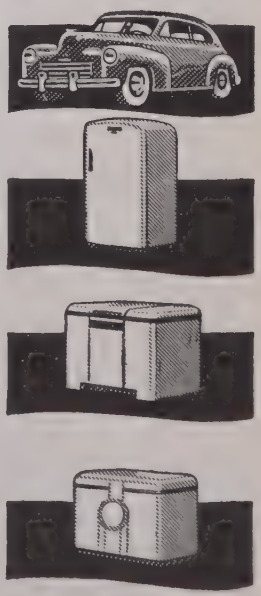

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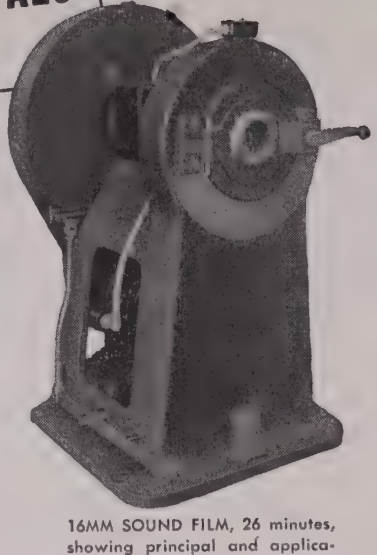

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NEWS OF INDUSTRY

Applications may be submitted t the National Screw Machine Prod ucts Association, the Rochester In stitute of Technology, the D. A Stuart Oil Co., or the Titan Meta Mfg. Company. In case applica tions are submitted to the last tw named, a duplicate is to be submit ted at the same time to the Na tional Screw Machine Products As sociation.

Photograph must be submitte with application.

All applications submitted shoul designate whether for the D. A Stuart Oil Co. or the Titan Meta Mfg. Company scholarship. Appli cations will close approximatel July 15.

In case it is necessary for an applicants to be interviewed i person by the committee, the appli cant should be prepared to trave to Rochester for that purpose o some date at approximately th middle of August.

New Alcoa Iowa Plant World's Largest Use Of Aluminum For Buildin

Davenport, Iowa

• • • **The huge** aluminum rollin mill nearing completion here wi contain over 6,250,000 lb of alumi num—the largest single applicatio of aluminum ever made in th building trade. Authority for thi statement is Aluminum Co. o America, which has nearly com pleted the mill to increase its shee and plate rolling facilities. Her according to Alcoa, it will roll th world's widest aluminum sheet.

The plant, nearly a mile lon contains 25,000 tons of structura steel, but aside from this aluminu has been used almost everywher else. The structural steel is painte with more than 3 carloads of alumi num paint; 3 miles of aluminum in sulated wall panels on the exteri weigh over 1 million lb; there ar 500,000 sq ft of aluminum windo sash; 400-odd doors and 227 al aluminum ventilators.

A 47-acre aluminum roof contain nearly 3 million lb of the meta Surrounding the buildings is th longest aluminum chain-link fenc in the world—8 ft high and 4 mile long, made of about 2 million ft o aluminum wire. Power and light re quirements consumed 1340 miles o insulated aluminum wire and cabl and 98 miles of aluminum condui

The PHILADELPHIA "Change Speed Gear Unit"

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WATERBURY FARREL
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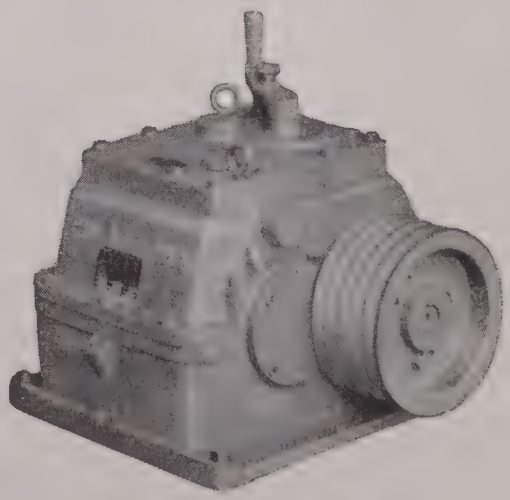
. . for driving their UPRIGHT CONE WIRE DRAWING MACHINE

The above illustration shows a No. 3 — 8 Die Upright Cone Wire Drawing Machine, commonly used for drawing brass wire, — having a starting capacity for No. 6 B&S gage, finishing at No. 10 or smaller B&S gage.

The Philadelphia Gear 4-Speed Change Gear Unit was chosen to provide the required speeds for four different block diameters, and for correcting the peripheral speeds of these blocks, according to their diameters.



The Philadelphia Change Speed Gear Unit installed on the above mentioned Waterbury-Farrel Wire Drawing Machine (and illustrated at the right) is driven by a 25 HP 690 RPM motor. The speed ratios available are:

5.55:1 — 4.4:1 — 1.5:1 — 1.2:1

These units are provided with a Cam Type Shifter which permits smooth operation of the clutches. Note the extreme compactness and rugged construction which is characteristic of all types of Philadelphia Speed Reducing Units.

Should you desire further information, please write for same on your business letterhead.

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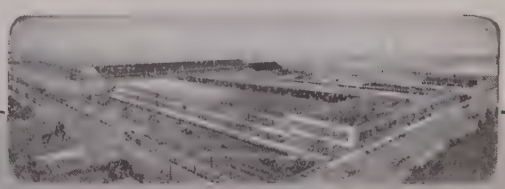

Industrial Gears and Speed Reducers
LimiTorque Valve Controls

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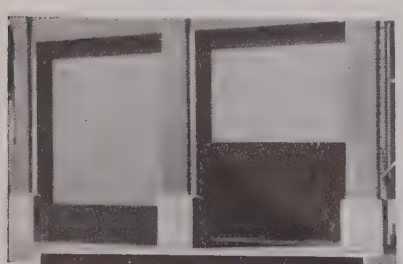
Efficiency Loss at Doorways

● Plant efficiency often bogs down at doorways without letting you know it. Costs pile up while vehicles wait for doors to be opened. Time and labor is lost when busy employees open or close doors. Heating and air-conditioning costs soar when doors aren't closed promptly.

You can put a quick stop to these profit leaks by installing Kinnear Motor Operated Rolling Doors.* With a touch of a button, you raise or lower these doors at a second's notice—from any number of convenient points. They open straight upward and coil compactly above the lintel; all floor and wall space is *fully usable* at all times. The opened doors stay overhead, safe from damage by wind or vehicles. Their rugged, all-steel construction assures longer wear, lower maintenance, extra protection against fire, theft, and storm damage.

Keep door efficiency in step with the rest of your plant; call your Kinnear representative, or write us today, for full information on Kinnear Rolling Doors.

**Manually operated Kinnear Rolling Doors also available.*



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1760-80 Fields Ave., Columbus 16, Ohio
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Offices and Agents in Principal Cities

Iron and Steel Exports For January Unchanged

Washington

• • • **Iron and steel** exports during January remained steady at about half a million net tons, the Commerce Dept. estimated last week.

The January total was reported at 500,767 net tons, as compared with 558,735 net tons for December. The January figure reflects a slight dip from the 1947 average monthly rate of exports. Total iron and steel exports in 1947 are estimated at 6,591,282 net tons.

The monthly totals are expected to climb sharply in the second quarter of 1948 when exports under the foreign aid program begin moving. A number of procurement contracts are already in the negotiation stage.

January iron and steel exports by commodity are as follows:

Semifinished and finished products: Ingots, blooms, billets, slabs, sheet bars, 41,590; wire rods, 4834; skelp, 5969; iron bars, 1032; concrete reinforcement bars, 13,924; steel bars, cold-finished, 6899; other steel bars (excluding alloy), 39,797; alloy steel bars, 14,270; weldin rods, electric, 945; boiler plate, 2361 other plates, not fab, 37,002; plates fab, punched or shaped, 2208; iron sheets, black, 1828; steel sheets black, 42,308; galvanized sheets 4396.

Strip steel, cold-rolled, 6587; strip steel, hot-rolled, 7346; tinplate and tagger's tin, 55,168; terne plate (in cluding long ternes) 646; structura shapes, plain, 29,813; structura shapes, fab, 17,347; frames and sashes, 176; sheet piling, 5112; rails 60 lb per yd and over, 42,445; rails less than 60 lb per yd, 752; rails relaying, 5950; splice bars and ti plates, 13,085.

Frogs and switches, 1220; railroad spikes, 1163; railroad bolts, nuts and washers, 787; car wheels, tires and axles, 3702; seamless black pipe 1419; seamless casing and oil lin pipe, 14,307; seamless boiler tubes 4526; welded black pipe, 5227 welded galvanized pipe, 3821 welded casing and oil line pipe, 12, 916; welded boiler tubes, 123; othe pipe and fittings, 6564.

Plain wire, 6572; galvanized wire 7830; barbed wire, 7251; woven wir fencing, 1300.

ooling Cure for THIRSTY THRONGS

★ You're in for a bigger, *pleasanter* surprise than you think, when you install your Electric Water Cooler! You'll see it do *more* than merely answer thirst. You'll see it put new freshness in tired faces . . . new sparkle in dulled eyes . . . new spring in lagging footsteps. You'll see how much *extra* refreshment there is in the bubbling clear freshness of *properly cooled* water. Get a fresh start, *give* a fresh start—to employees, customers, associates—with low-cost, scientifically correct thirst protection. Install Kelvinator-refrigerated Electric Water Coolers, *today!*

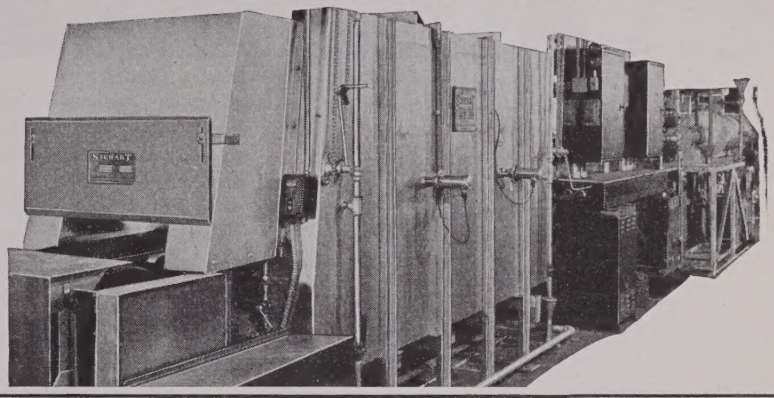
The EBCO Manufacturing Company
Town and Lucas Sts. Columbus 8, Ohio

No. 79 of a Series of Typical Installations

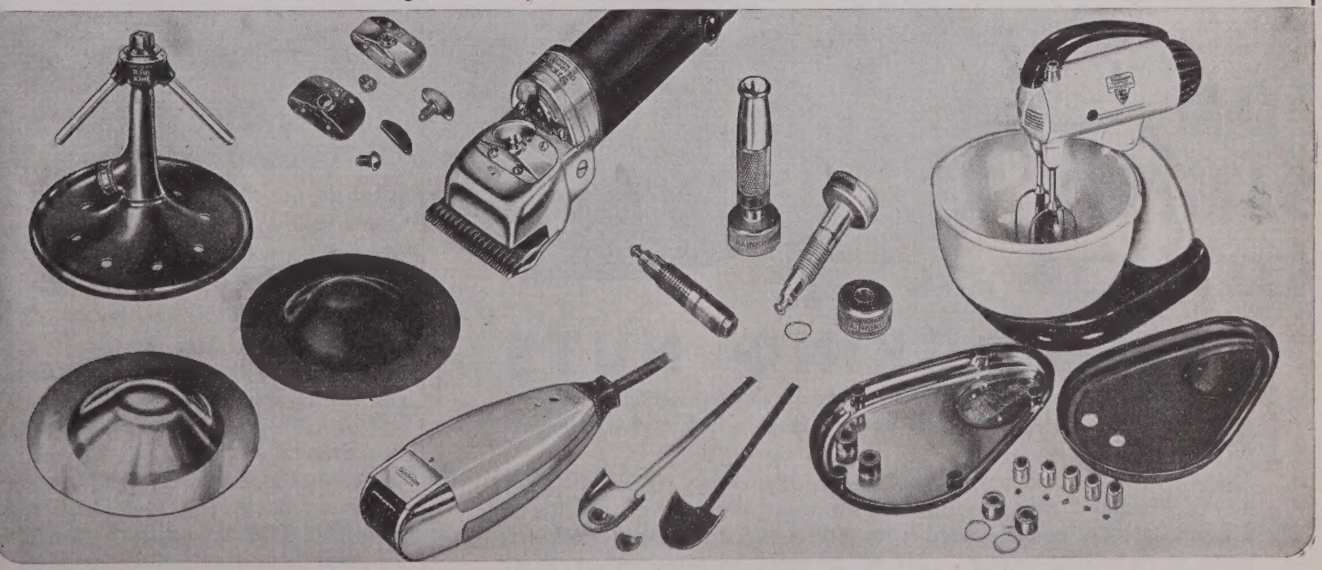
Sunbeam
STEWART
THE BEST INDUSTRIAL FURNACES MADE

ELECTRIC FURNACE BRAZING AIDS MASS PRODUCTION AT SUNBEAM

A variety of Sunbeam products are copper brazed, silver soldered, and bright annealed in this versatile Sunbeam Stewart Continuous Electric Brazing unit. Result: Increased production, lower operating cost and improved quality.



AS A division of the Sunbeam Corporation, Sunbeam Stewart has the practical advantage of designing furnaces used in the parent plant, and to work closely with its heat treating problems. This experience with Sunbeam Stewart Furnaces in large volume production enables us to render a service far beyond other furnace manufacturers—a position unique in the furnace manufacturing field. That is one reason why Sunbeam Stewart installations have been so successful.



This Sunbeam Stewart Electric Brazing Furnace is used for bright annealing the Rain King Sprinkler base (above, left) during forming. This base requires no further cleaning before the final surface treatment is applied. The wing set screw of the Clipmaster (top left, center) is copper brazed from two sections. The versatile unit is also used for silver soldering the Rain King hose nozzle (top right, center). Screw cap and stem are produced separately from high strength brass bar stock and then silver soldered. For the Shavemaster (center, below) a liquid copper brazing solution is painted on the area of the clip which is later brazed to the larger part. The entire base of the Sunbeam Mixmaster (above, right) is assembled by brazing. A bright sheen of the brazed base shows the protection given by the furnace atmosphere.

SUNBEAM STEWART INDUSTRIAL FURNACE DIVISION of SUNBEAM CORPORATION
(Formerly **CHICAGO FLEXIBLE SHAFT CO.)**

Main Office: **Dept. 110, 4433 Ogden Ave., Chicago 23** — ***New York Office:*** **11 W. 42nd St., New York 18** — ***Detroit Office:*** **3409 E. Grand Blvd., Detroit 2**
Canada Factory: **321 Weston Rd., So., Toronto 9**

A letter, wire or 'phone call will promptly bring you information and details on SUNBEAM STEWART furnaces, either units for which plans are now ready or units especially designed to meet your needs. Or, if you prefer, a SUNBEAM STEWART engineer will be glad to call and discuss your heat treating problems with you.

A FORTUNE IN PATTERNS

This is one of our storage sections. ***Strenes Metal*** castings have been made from these patterns.

Here are patterns for forming and drawing dies used by many of the largest sheet metal fabricators . . . manufacturers of appliances, automobiles, bicycles, blowers, caskets, implements, tractors, trucks, vaults, etc.

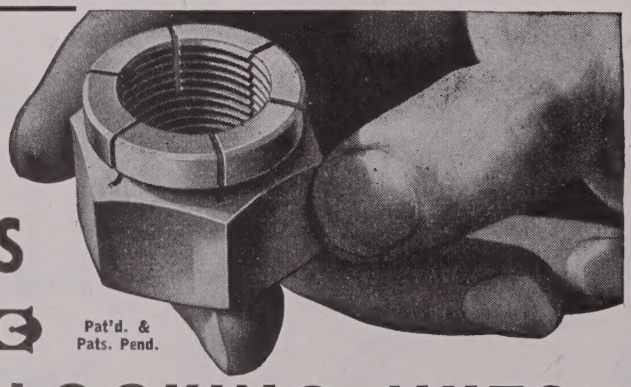
Here are also patterns for ***Strenes Metal*** castings employed as parts of equipment . . . bushings, melting pots, pump housings and impellers, lathe beds, machine bases and the like.

When you visit our plant, you'll probably be surprised at the volume of ***Strenes Metal*** castings we pour from day to day.

Strenes Metal
DRAWING AND FORMING DIES

THE ADVANCE FOUNDRY COMPANY

ASK FOR SAMPLES



FLEXLOC Pat'd. & Pats. Pend.

SELF-LOCKING NUTS

The one-piece, all-metal "Flexloc" packs maximum usefulness in minimum space by combining, as it does, a stop, a lock and a plain nut all in one.

Every thread—including the locking threads—takes its share of the load. "Flexloc" accommodates itself to a wide range of thread tolerances . . . can be used over and over again without losing much of its locking torque . . . is not affected by temperatures likely to be met within the field of Mechanical Engineering . . . and being a "stop" nut, it stays locked in any position on the threaded member. The "Flexloc" is processed to have an exceptionally uniform torque. The *Thin* "Flexloc" has become very popular because its *tensile* is so high and the space it occupies so small.

Sizes from #6 to 2" in diameter—in "regular" and "thin" types—in NC and NF thread series. *Write for "Flexloc" Catalog.*

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Jenkintown, Penna., Box 523 • Branches: Boston • Chicago • Detroit • Indianapolis • St. Louis • San Francisco

Clay Deposit Alumina Experiments Considered

Washington

• • • **Senate Interior** Committee is considering a bill authorizing government experiments in manufacture of alumina from domestic anorthosite clay deposits.

This measure (S. 2394), sponsored by Senator O'Mahoney, D., Wyo., would make the government-owned plant at Laramie, Wyo., available as a demonstration plant for production of alumina from the local clay deposits. Bureau of Mines would be authorized to operate the plant.

The government built four plants —at Harleyville, S. C.; Salem, Ore.; Philadelphia and Laramie—during the war for such experiments. All except the Laramie plant have been sold or leased and none is now engaged in research work. Senator O'Mahoney points out that the Laramie plant is the "last chance for an effective test of the manufacture of alumina from domestic deposits."

Anorthosite deposits in Wyoming cover an area of 432 square miles and are estimated at 11 billion tons. Senator O'Mahoney estimates it will take $500,000 to equip the plant.

Voluntary Allocation Asked On Construction Materials

Washington

• • • **The Commerce Dept.** is seeking to bring producers of certain housing materials under the voluntary allocations program.

Officials of the department's Office of Industry Cooperation—the agency charged with execution of the new Public Law 395—will meet this month with representatives of the cast iron pressure pipe and fittings industry, the cast iron soil pipe and fittings industry, and the plywood manufacturing industry.

The first meeting will involve the cast iron pressure pipe and fittings industry and is scheduled to take place Mar. 22. Meetings will be held with the cast iron soil pipe and fittings industry on Mar. 23 and with the plywood industry on Mar. 30. A similar meeting will be held with representatives of the soda ash and caustic soda industry on Mar. 25.

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THE MELTER KNOWS . . . . .

THE experienced melter knows he
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iform effects as calculated. He knows the
stomer can depend on the higher physical
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agent is good to have. As a supplier of Molyb-
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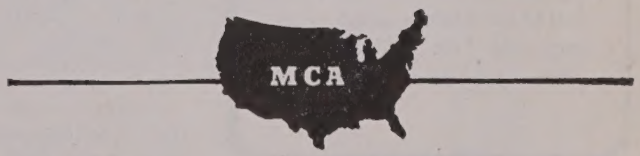

AMERICAN Production, American Distribution, American Control, Completely Integrated.

Offices: Pittsburgh, New York, Chicago, Cleveland, Detroit, Los Angeles, San Francisco, Seattle.

Sales Representatives: Edgar L. Fink, Detroit; Brumley-Donaldson Co., Los Angeles, San Francisco, Seattle.

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Works: Washington, Pa.; York, Pa.

Mines: Questa, New Mexico; Urad, Colorado.

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GRANT BUILDING **PITTSBURGH, PA.**

MCA

R-S FURNACE FACTS

ISSUED MONTHLY BY R-S PRODUCTS CORPORATION, PHILADELPHIA 44, PA., FOR THOSE CONCERNED WITH QUALITY HEATING OF METAL

At a meeting of steel engineers
This jingle was sung to their cheers:
"The blueprints don't show it
But engineers know it . . .
R-S units are built for the years"

We not only build for the years but we build so R-S Furnaces will run for years with a minimum of upkeep. Johnnie Huber, in charge of the big R-S rotary furnace at Crucible Steel in Harrison, New Jersey reports that his unit has been running over five years virtually without repairs. Temperatures run well over 2000° F. so this furnace really takes a beating. We have other records of the sort on file. You should see some of them to compare with your own experience of furnace upkeep costs.

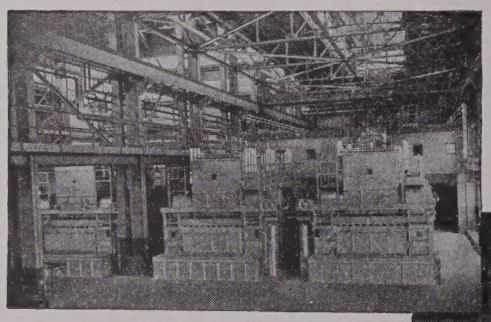
Naturally, you pay a little more for an R-S Furnace. That's our profit (we *won't* sell at cost just to get a sale); and it's your insurance. Like paid-up insurance, it pays you dividends.

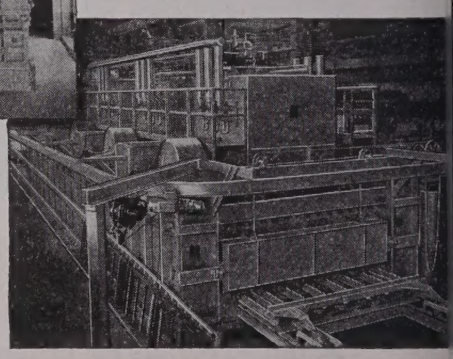
JMLco P-K1

R-S Triplets Supply Feed for Gargantuan Die-Forging Press

See the little man! (by column, lower left). Gives you an idea of the size of these three R-S Furnaces which supply aluminum and magnesium billets for the world's largest die-forging press. This huge press is in the Wyman-Gordon Products plant at North Grafton, Mass. It's close to Worcester if you're looking for it on your road-map.

Last month in the September edition of Furnace Facts we showed you one of the





furnaces alongside the press. This issue shows all three (left). Actually, there are four furnaces in this R-S family but it doesn't make them quads because the fourth member of the family (right), is a pusher type roller rail convection type job for heat-treating the forgings that come from the press.

The triplets are propane-fired apron conveyor type furnaces, each with a heating-chamber 8 feet 6 inches by 39 feet. The three turn out a total of 13,200 pounds per hour of billets heated to a uniformity of plus or minus 2° F. within a range of 250° to 1000° F. We think that's very, very accurate for equipment of this size. We get it by the unique temperature zone control characteristic of R-S Furnaces. Indicating controllers are furnished for each external heater an for each work zone. Both instruments i each zone work with the same motor-op erated control valve. Two multiple re corders on each furnace provide a con tinuous record of the temperature fo each external heater and for each wor zone. Control switches in each recorde automatically sound an alarm and clos the main fuel valve if temperature ove runs at any point.

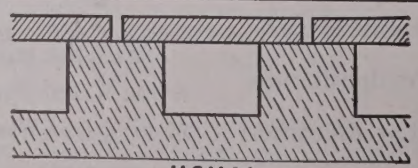
Additional protection against ex cessive temperature conditions provided by a separate high-limi control for each zone. This close a solenoid valve for each zone an shuts off the flow of gas. Furthe protection is in the form of a flow switches at each fan, als connected with the solenoid valve to cut off the flow of gas in the event tha either fan stops for any reason.

The heat-treating furnace has a heat ing chamber 12½ feet wide by 61 fee long. The temperature range is 250° t 1000°F. Automatic heat control for zones is provided, with the same syster of forced convection heating and tem perature control as described for the forg ing furnaces.

Car Hearth Piers can Cost Money or Save Money

The common method of building car-hearth piers is to lay the tile smack dab on top of the piers. This throws a big load on the tiles spanning the combustion chambers. Since tile doesn't have the resilience to become sway-backed it just plain cracks and breaks. Then you shut down and put in new tile.

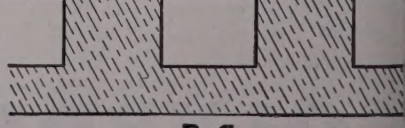
R-S builds a vertical extension on the piers to carry the load, leaving shoulders on which the tile rests free of strain.



USUAL

This has the advantage of leaving you free of maintenance.

Sometimes, for extra protection against abrasion, we cap the pier-head with casting as shown on the right pier below



R-S